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VOLUME XXXIII JANUARY, 1952 NO. 1

American Congress of Physical Medicine

30th Annual

Scientific and Clinical Session

and

Instruction Seminar

August 25, 26, 27, 28, 29, 1952

Official Headquarters

THE ROOSEVELT

New York, New York

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Contents — Jan. 1952

Volume XXXIII No. 1

ARCHIVES OF PHYSICAL MEDICINE
(Formerly Archives of Physical Therapy)
30 North Michigan Avenue, Chicago 2, Illinois

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Published monthly at Chicago, Illinois, by American Congress of Physical Medicine.

Entered as Second Class Matter, February 15, 1945, at the Post Office at Chicago, Illinois, under the Act of March 8, 1879.

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SPHENOPALATINE BLOCK IN THE RELIEF OF MUSCULOSKELETAL PAIN

MAURICE S. RAWLINGS, CAPT., M.C., U.S.A.**

and

CHARLES S. WISE, M.D.*

Ruskin[1] and Amster[2] have claimed dramatic relief of musculo-skeletal pain in a wide variety of clinical conditions following the use of topical sphenopalatine anesthesia. Their method consisted of application of a surface anesthetic to the posterior nasopharynx in patients exhibiting muscle spasm and pain associated with rheumatoid arthritis, low back pain, subdeltoid bursitis and other clinical entities. Following single or repeated applications, marked subjective and objective relief was reported in almost all their patients. Despite the lack of a controlled study by these authors, the simplicity of the technique employed and the excellent results claimed warranted a more critical review of the procedure.

This paper presents a controlled study of the effectiveness of sphenopalatine block in a group of patients suffering with a variety of musculoskeletal and related disorders. The study included 178 individual treatments. Sixty-nine of these treatments were considered placebo in nature.

Method

All of the patients in this series were selected from a hospital out-patient department; most of the patients were selected from an arthritis clinic. The procedure employed closely followed that described by Amster[2] and consisted of the intranasal introduction of two per cent tetracaine (Pontocaine ®) hydrochloride on cotton applicators to the vicinity of the sphenopalatine ganglia bilaterally where they were allowed to remain for a period of twenty minutes. A control group received a similar application of normal saline which had been tinted with methylene blue to simulate the color of tetracaine hydrochloride solution. Other controls received either two per cent tetracaine hydrochloride or normal saline applied beneath the tongue. The saline had been tinted with methylene blue and flavored with lemon extract to imitate tetracaine hydrochloride solution in appearance and taste.

Before each treatment the patients were given the same instructions. They were told that the treatment was an experimental procedure being studied for its possible pain-relieving effects; that it might or might not have any effect on their particular pain. No other verbal suggestions were given as to its probable effects. Subjective complaints and objective findings were evaluated both before and after treatment. Limitation in joint motion, tenderness of the affected areas, and an estimation of the degree of pain were carefully recorded in each case. Certain individuals received specific measurements of performance, such as maximum strength measurements of various muscle groups. These evaluations were made before treatment, at the termination of treatment twenty minutes later, and again when the patient returned on a subsequent visit one or more days later. The patient

** Resident in Medicine, The George Washington University Hospital, 1949-1950.
* Director, Department of Physical Medicine and Rehabilitation, George Washington University, Washington, D. C.

1. Ruskin, S. L.: A Newer Concept of Arthritis and the Treatment of Arthritic Pain and Deformity by Sympathetic Block at the Sphenopalatine (Nasal) Ganglion and the Use of the Iron Salt of the Adenylic Nucleotide, Am. J. Digest. Dis. **16**:380, 1949.
2. Amster, J. L.: Sphenopalatine Ganglion Block for the Relief of Painful Vascular and Muscular Spasm with Special Reference to Lumbosacral pain, New York State J. Med. **48**:2475, 1948.

was instructed to record the duration of any effects noted. The results were graded several days after each treatment and in those instances where patients received more than one treatment, a final evaluation and grading was made at the end of the completed course. The results were graded as excellent, good, fair, or unchanged. Those graded as "excellent" were patients who had complete relief of symptoms persisting for days or weeks following treatment as well as similar objective evidence of improvement. The patients graded as "good" showed considerable but incomplete relief of subjective symptoms, with some improvement in objective findings which continued for several day or weeks. Those patients considered as "fair" had partial relief of subjective symptoms but only slight, if any, improvement in objective findings. The unchanged group had no effects noted subjectively or objectively. There were no patients who attributed exacerbation of symptoms to this procedure.

Results

Because of the wide variety of clinical disorders and the response obtained, the number of treatments per patient varied. The majority of patients received one to three applications, although several received more. The clinical diagnosis in the seventy-two patients treated is shown in the following table:

Diagnosis	Number of Cases
Rheumatoid arthritis	21
Hypertrophic arthritis	10
Low back pain	12
Fibrositis	9
Subdeltoid bursitis	6
Rheumatoid spondylitis	4
Tension headache	4
Neuralgia	4
Miscellaneous	2
Total	72

Clinical diagnosis of patients treated.

Of the seventy-two patients treated, forty-four received two per cent tetracaine hydrochloride as sphenopalatine blocks. A control group of twenty-eight patients received topical application of saline to the sphenopalatine area or sublingual application of either saline or tetracaine hydrochloride as described above. Some of these control patients subsequently received tetracaine hydrochloride applications to observe comparative effects. Twelve patients in the control group received no tetracaine hydrochloride to the sphenopalatine area at any time. As previously described, the response to each treatment was recorded, and a final evaluation of each patient's response was determined on the basis of degree and duration of improvement at the completion of all treatments. These final patient evaluations are shown in the following table:

Pontocaine (44 Cases)		Control (28 Cases)	
Excellent 23% (10)	62% improved	25% (7)	75% improved
Good 25% (11)		36% (10)	
Fair 14% (6)		14% (4)	
Unchanged 38% (17)		25% (7)	

Final evaluation of individual cases.

For comparison, an analysis of the response obtained for each of the 178 treatments is shown in the following table. These results are based on the evaluation of each individual treatment; the evaluation being made one or more days following the individual application.

Tetracaine Hydrochloride		Control (69 Treatments)	
Excellent	27% (29)	33% (23)	
Good	40% (44) } 81% improved	26% (18) }	81% improved
Fair	14% (15)	22% (15)	
Unchanged	19% (21)	19% (13)	

Evaluation of effects of each of 178 treatments.

Discussion

The fact that a great number of pharmacological agents may be employed in the symptomatic relief of musculoskeletal pain is in itself an implication of their non-specific nature. Likewise, the results of the studies tabulated clearly indicate that the effects of anesthetization of the sphenopalatine ganglia as described by Ruskin[1] and others cannot be explained on the basis of any specific neurogenic reflex in the autonomic nervous system. In our early clinical trials employing tetracaine hydrochloride sphenopalatine block in active rheumatoid arthritic patients, the marked and even dramatic improvement obtained in some patients led us to attempt a more controlled study. Normal saline was then applied to the posterior pharyngeal area in several patients as a control. This resulted in responses similar to those obtained with tetracaine hydrochloride. In order to obviate the possibility of mechanical irritation of the sphenopalatine area by the cotton applicator, which might serve as a possible mechanism either neurogenically or reflexly through the adrenal cortex, applicators of tetracaine hydrochloride were placed sublingually. As a further control to rule out systemic effects of absorption of tetracaine hydrochloride through the mucous membrane, another group of patients were studied using sublingual saline, also with comparable results.

A remarkable finding in the entire group studied was the high percentage of patients showing objective and subjective relief to a procedure having no demonstrable pharmacological or physiological basis. Many patients with obvious, active, severe rheumatoid arthritis showed marked symptomatic relief of pain within several minutes after treatment. A few patients with acute lumbosacral strain also showed complete relief of symptoms and increased or complete range of motion of the lumbar spine. One patient complaining of low back pain for twelve years had complete and continuing relief of symptoms for at least three months (when last seen) following the application of sphenopalatine block. Equally dramatic results were observed in the control group.

Comparing the results of the tetracaine hydrochloride and control groups, there was essentially no difference. In fact, a small group of patients receiving only sublingual placebos showed the highest percentage of satisfactory results (87 per cent improved in 31 sublingual applications). It appears from these studies that suggestion is the modus operandi for the relief of musculoskeletal pain obtained by sphenopalatine block.

The effectiveness of suggestion in influencing any therapeutic procedure or drug has been beautifully demonstrated in the pain threshold experiments of Wolff and Wolf.[3] Beside the specific pharmacologic effects of a given

3. Wolff, H. G., and Wolf, S.: Pain. Am. Lects. in Physiol. Cp. 93, Thomas Co., Springheld, Ohio, 1948.

therapeutic agent, equally profound effects may occur by way of suggestion inherent in the use of the substance or by way of any transferable optimism on the part of the attending physician. The existence of an extensive list of physical as well as pharmacologic agents valuable in the treatment of various musculoskeletal disorders may be in part due to psychogenic factors that are inherent in any form of medical treatment. Seidel and Abrams[4] found that hypodermic administration of saline was just as effective as vaccines in treating the chronic rheumatoid state. It is to be noted that in our control group, 75 per cent of the patients treated were subjectively or objectively improved, including 25 per cent who were graded as having "excellent" results. Many in this latter category could be described as exhibiting "dramatic" improvement. These results suggest that any medication or therapeutic procedure claimed to be specifically effective in the treatment of musculoskeletal pain should evoke improvement in more than 75 per cent of cases treated, and excellent results in 25 per cent of cases. Conversely, it can also be stated that one should not look for obscure neurogenic reflexes or pharmacologic actions of the various medications and procedures employed in the relief of musculoskeletal pain unless the possibilities and the varied profound effects of suggestion have been carefully controlled. A good review of the use of placebos in therapy may be found in the Cornell Conferences on Therapy.[4]

In patients with acute or subacute low back pain or other musculoskeletal disorders, the presence of protective muscle spasm may persist long after the initial cause of low back pain has subsided. This prolonged immobilization may lead to structural changes or pain, while prolonged muscular contraction through distortion of muscle, ischemia, fatigue and traction on other structures may lead to further painful stimuli, tending to maintain the muscle spasm. Relaxation of this spasm is frequently followed by the disappearance of pain and the return of mobility. This has been variously accomplished through local or spinal anesthesia, spasmolytic drugs, psychotherapy, and physiotherapy. The method of "mechanical psychotherapy," such as topical sphenopalatine block, seems to be quite effective in alleviating, at least temporarily, the psychogenic component of many organic symptoms, and could be useful in determination of such a differentiation. Susselman[5] suggests that the differentiation may also be made by the intravenous injection of 0.1 Gm. of amobarbital sodium (Sodium Amytal®). The dose apparently is sufficient for relaxation, but insufficient for analgesic effect. Some have felt that the differential response between local procaine and saline injections could be used diagnostically.[6]

The incidence of functional states in arthritic and musculoskeletal disorders have not been as widely appreciated as they have in the fields of neurology, cardiology and gastroenterology. In military medicine, psychogenic complaints localized in the muscles and joints were comparable to those in the cardiovascular and gastrointestinal system.[7,8,9] This is made evident by the large number of patients admitted to the arthritic and orthopedic wards with organic diagnoses in which inadequate or no structural changes existed.[7] Functional musculoskeletal disorders treated by placebo or nonspecific ther-

4. Seidel, and Abrams: The Use of Placebos in Therapy, Cornell Conferences on Therapy, Vol. 2, p. 5, MacMillan, New York, 1947.
5. Susselman, S., et al.: Intravenous Injection of Amobarbital Sodium (Sodium Amytal ®) as a Test for Latent Anxiety, Arch. Neurol. & Psychiat. 56:567, 1946.
6. Steinbrocker, O.: Therapeutic Injections in Painful Musculoskeletal Disorders with Special Reference to the Saline-Procaine Test. J. A. M. A. 125:397, 1944.
7. Boland, E. W., and Corr, W. P.: Psychogenic Rheumatism, J. A. M. A. 123:805, 1943.
8. Short, C. L.: Arthritis in the Mediterranean Theater of Operations. 1. Incidence of Joint Disease — Clinical Description of Rheumatoid Arthritis. 2. Clinical Description of Hypertrophic Arthritis, Arthralgia and Psychogenic Rheumatism, New England J. Med. 236:583, 1947.
9. Somatization Reactions. Bull. U. S. Army M. Dept. 5:640, 1946.

apy over prolonged periods may lead to fixation of symptoms and should be avoided.

In view of the large incidence of functional overlay in musculoskeletal disorders, sphenopalatine block would be expected to be effective in a large per cent of any group of patients so treated, and might serve as a useful adjunct to physiotherapy in determining those cases with overlying psychological disorders that may require treatment by psychological means.

Summary

1. A controlled study of the efficacy of surface anesthetization of the sphenopalatine ganglion area for the relief of musculoskeletal pain has been presented.

2. A group of 72 patients received a total of 178 test applications. Forty-four patients received 2 per cent (Pontocaine®) tetracaine hydrochloride to the sphenopalatine area. Twenty-eight received sublingual applications or intranasal saline as control procedures.

3. There was no significant difference in response between control and test groups. Seventy-five per cent of control patients were benefited compared to sixty-two per cent for the test group.

4. Topical sphenopalatine block is considered a non-specific procedure having no demonstrable pharmacological or physiological basis. It would appear that suggestion is the modus operandi.

5. The large incidence of musculoskeletal neurosis and psychogenic rheumatism, either pure or superimposed on organic lesions, is comparable to the high incidence of improvement from sphenopalatine block obtained in this series. Sphenopalatine block, therefore, should be considered a psychotherapeutic agent only; although it may also serve to temporarily relieve the functional aspects of disability in some cases of organic disease.

6. No physical or pharmacological therapy effective in musculoskeletal disease should be considered specific until the varied and profound effects of suggestion have been carefully controlled.

DIAGNOSIS OF INJURY TO THE ROOTS AND BRANCHES OF THE LUMBAR PLEXUS WITH REPORT OF A CASE *

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and

JOHN H. KUITERT, LT. COL., M.C.***

WASHINGTON, D. C.

Diagnosis of Traumatic Injury to the Roots and Branches of L-2, 3 and 4: Report of a Case

Interest in nerve injuries is always stimulated during the hostilities of modern warfare. Injury to several branches of the lumbar plexus secondary to a shell fragment wound presents a remarkable study in anatomy (fig. 1).

The lumbar plexus is located in the substance of the psoas muscle.[1] It is usually formed by the anterior primary divisions of the first three lumbar nerves, part of the fourth and occasionally part of the twelfth thoracic nerve. The first, second and fourth lumbar nerves each divide into upper and lower branches. The upper branch of the first lumber nerve forms the iliohypogastric and the ilioinguinal nerves. The lower branch of the first lumbar nerve unites with the upper branch of the second lumbar nerve to form the genitofemoral nerve. The lower branch of the second lumbar, all of the third and the upper branch of the fourth lumbar divide into anterior and posterior divisions, which ultimately form the primary motor nerves of the lumbar plexus. The three anterior divisions join to form the obturator nerve and the posterior divisions unite to form the femoral nerve and the lateral femoral cutaneous nerve. From the roots small twigs supply the psoas and quadratus lumborum.

The femoral nerve is motor to the iliopsoas, sartorius, pectineus and quadriceps muscles. It is sensory via the anterior femoral cutaneous nerve to the anterior and medial surfaces of the thigh and via the saphenous nerve to the medial side of the leg and foot.

The obturator nerve is motor to the obturator externus, adductors and gracilis. It is sensory to the medial aspect of the lower thigh.

Report of a Case

A 22 year old colored Army sergeant was wounded by a mortar shell fragment on August 11, 1950 in Korea. He was struck in the back just to the left of the spine of L-3 and was evacuated to a field hospital. A shell fragment was removed from the abdomen and a wound of the jejunum was repaired. During his convalescence atrophy of the left thigh was noted which was obscured by a complicating thrombophlebitis which responded to therapy. The patient was transferred to the U. S. and arrived at an Army hospital on December 28, 1950.

Physical examination revealed a well healed right rectus surgical incision. On the back just to the left of the midline at the level of L-3, there

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1. McDonald, J. J.; Chusid, J. G., and Lange, J.: Correlative Neuroanatomy, ed. 5, Los Altos, Calif., University Medical Publishers.

was a small scar, which was the wound of entrance. The extremities revealed atrophy of the left thigh. X-ray revealed a foreign body at the level of the second and third lumbar interspace (fig. 2).

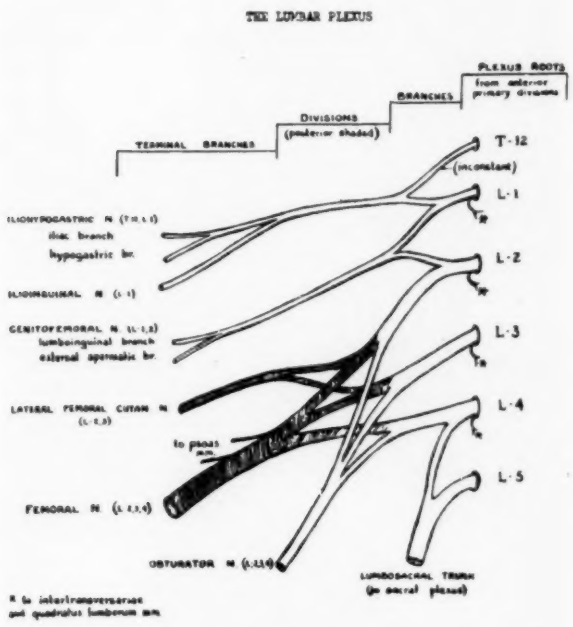

Fig. 1. — The Lumbar Plexus:
From McDonald, Chusid and Lange, Correlative Neuroanatomy, University Medical Publishers.

Sensory examination[2] revealed hypesthesia over the antero-lateral and medial aspect of the left thigh, antero-medial aspect of the left knee and antero-medial aspect of the left leg and median aspect of the foot. Reflexes were all normal except the left knee jerk, which was absent. A voluntary muscle test[3] revealed the following strengths expressed in percentages of 100. Left quadratus lumborum — 100, left iliopsoas — 5, quadriceps 0-10 per cent, sartorius — 0, adductors (magnus) — 10, gracilis — 0, biceps femoris, semitendinosus and semimembranosus — 60, gluteus maximus — 80, gluteus medius and tensor fascia latae — 80. All other muscles in left lower extremity were 100 per cent.

Cobalt Chloride Sweating Test

When there is interruption of a nerve, the area supplied by the nerve loses its sympathetic nerve supply and thus, its ability to perspire. The co-

2. Haymaker, and Woodhall: Peripheral Nerve Injuries, W. B. Saunders Co., Phila., 1945.
3. Kendall, and Kendall: Muscle Testing and Function, Williams & Wilkins, Baltimore, 1949.

balt chloride in the non-sweating area, represented by the shaded pattern, remained blue and unchanged (fig. 3).

Fig. 2. — Roentgenogram, Anteroposterior of Lumbar Spine, Showing Foreign Body.

Neuro-Dermometry Skin Resistance

This test[4] depends upon the sympathetic component of the peripheral nerve. Thus, elimination of the sympathetic supply produces an increase in the skin resistance. The pattern of increased skin resistance was similar to the sweating pattern noted in the cobalt chloride test.

Electrical Diagnosis

Faradic Test. — There was no response elicited over the left quadriceps muscle to the faradic current.

Galvanic Test. — The response of the muscle to the galvanic stimulation was sluggish and slow.

Electrodiagnostic examination (EDX) revealed that the strength-duration curve was elevated with a steep slope. The repetitive stimuli revealed a wide spread with the lower frequencies. The tetanus contraction was incomplete with the maximum tolerable current.

4. Richter, C. P., and Woodruff, B. G.: Lumbar Sympathetic Dermatomes in Man Determined by the Electrical Skin Resistance Method, J. Neurophysics 8:323, 1945.

Electromyography

An electromyogram was done on January 8, 1951, using the intramuscular needle electrode technique.[5] The following muscles were examined: The left quadriceps, sartorius, and adductors which all revealed fibrillation

Fig. 3. — Cobalt Chloride Sweating Test.
Shaded Pattern Represents Non-Sweating Area.

and complex motor units. Low voltage normal units of 150 watts was recorded. The hamstrings, tensor fascia, lata, gluteus medius and maximus revealed normal motor units. Some complex motor units were found to a lesser extent the tensor fascia and gluteus medius. The findings are consistent with injury to the roots and branches of L-2-3-4 on the left in the paravertebral region.

5. O. Leonard Huddleston, M. D.; James G. Golseth, M.D.; Alberto A. Marinacci, M.D., and Elizabeth Austin, M.D.: Archives of Phys. Med. 31:378 (June) 1950.

Conclusion

This case is presented because it not only demonstrates the methods available for adequate study of a peripheral nerve injury but also for localization of that lesion anatomically.

The sensory examination, cobalt chloride and skin resistance tests, place the lesion in the distribution of the femoral and obturator nerves which are derived from the second, third and fourth lumbar nerves. (See fig. 1.)

The voluntary muscle test further localizes the lesion, because strong voluntary function of the quadratus lumborum is indicative of an intact proximal root and the weakness is distal to this point.

The fibrillation found to be present in the muscles supplied by the roots of L-2 and 3 is absolute evidence that denervation is present. The additional findings of complex motor units in the tensor fascia lata and gluteus medius to a lesser degree, with predominantly normal motor units, signifies a partial involvement of the fourth lumbar root. This also explains the trace function and low voltage readings in the quadriceps and trace function in the iliopsoas, which both receive part of their innervation from the fourth lumbar nerve.

This lesion should specifically involve the lower branch of the second lumbar root, the distal root and branch of the third lumbar root and part of the upper branch of the fourth lumbar root.

Summary

1. A review of the lumbar plexus is presented.

2. A case of traumatic injury to the roots and branches of the lumbar plexus is reported.

3. The methods of diagnosis available to localize a peripheral nerve injury are presented.

4. The value of electromyographic studies in the diagnosis of peripheral nerve root injury (not easily accessible by other methods) is presented.

A MECHANICAL QUADRICEPS *

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and

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Impairment of quadriceps function, varying from mere weakness to complete paralysis, presents an important problem in rehabilitation work. The quadriceps is a key muscle in the maintenance of the upright posture and in locomotion. It prevents the knee from collapsing when acted upon by the weight of the body. It extends the leg from a position of flexion and makes forward stepping possible. The quadriceps is assisted in performing these functions by the tensor fascia lata and the gluteus maximus. Injury to the quadriceps is common in fractures of the femur. Adhesions which form between the muscular layers prevent efficient muscle contraction. Paralysis of the quadriceps due to direct injury to the femoral nerve is relatively rare. This is because the nerve runs very close to the femoral artery and vein, and any trauma to the nerve also involves the femoral vessels; this results in exsanguination and death, or amputation, because of inability to establish a proper collateral circulation after the ligation of these vessels. On the other hand, disease affecting the nerve cells and the axons of the femoral nerve is frequent in any lower motor neuron involvement, such as poliomyelitis and peripheral neuritis. The quadriceps atrophies very readily in many patients who are confined to bed. The atrophy is more than just a disuse atrophy and is based on some reflex phenomenon which is not yet understood.

The prevention and treatment of quadriceps atrophy and weakness, or partial paralysis, consists mainly in active and resistive exercises. In many cases, in spite of a prolonged course of exercise, there is enough residual weakness to prevent the patient from standing or walking. To overcome quadriceps paralysis and deficiency, the standard procedure is to apply a long leg brace with a knee lock, which keeps the knee rigid for the support of the body. When the patient sits down he releases the knee lock and is able to flex the extended extremity at the knee. It is obvious that a long leg brace with a knee lock is a rigid formidable apparatus to wear in walking, and there is the added inconvenience of having to release the knee lock on sitting down, especially when the patient uses crutches. Where an upper extremity is involved in addition, as in hemiplegia or some cases of poliomyelitis, the unlocking of the knee, in addition to crutch handling is very inconvenient for the patient.

As a substitute for an irreversible, permanent weakness, or paralysis of the quadriceps, a brace attachment has been developed by Mr. D. J. Cronin. This consists of a spiral spring of piano wire, made of tempered steel, which

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* From the Physical Medicine Rehabilitation Service and Orthopedic Brace Shop, Veterans Administration Hospital, Fort Howard (Baltimore), Maryland.

* This is the first of a series of steel spring substitutes for permanent, irreversible muscle deficiencies, which are being worked out through the cooperative efforts of the Physical Medicine Rehabilitation Service and the Orthopedic Brace Shop.

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‡ Supervisor, Orthopedic Brace Shop.

* Published with permission of the Chief Medical Director, Department of Medicine and Surgery, Veterans Administration, who assumes no responsibility for the opinions expressed or conclusions drawn by the authors.

is attached with screws to a standard long leg brace (fig. 1). The tension developed by the spring ABC depends upon the gauge of wire, the number and circumference of turns, and whether a spring is used on one side or both sides of the brace. The tension of the spring ABC, acting through its levers

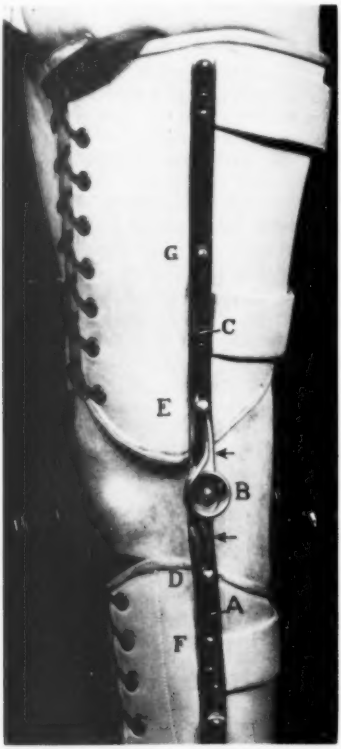

Fig. 1. — Spiral spring ABC attachment to long leg brace by posts D and E and screws F and G. Direction of tension is shown by arrows.

AB and BC, produces a tension in the direction shown by the arrows. This keeps the knee extended in standing and in walking. On sitting down the leg is flexed by the action of the hamstrings, which overcome the tension of the spring. This eliminates the necessity of a knee lock on the brace (fig. 2). In walking the spring allows for some to and fro flexibility of the knee joint (fig. 3), which is an additional improvement over the absolute rigidity of the usual long leg brace with a knee lock. The degree of quadriceps deficiency and strength of the hamstrings will determine the amount of tension desired in the spring. This in turn will be accomplished by the proper choice of wire, number of coils, and whether a unilateral or bilateral attachment is fixed to the brace.

Fig. 2. — In sitting down, the tension of the spiral spring is overcome by the hamstring muscles. Note, there is a foot drop element incorporated in this brace, to overcome a coexisting foot drop.

Fig. 3. —In walking there is some to and fro flexibility at the knee joint.

Predetermination of Tension in the Spring

It is desired to have the greatest tension in the spring. The stronger the spring action, the greater will be the stability at the knee joint. The limiting feature is the strength of the hamstrings, because they have to overcome the tension of the spring on sitting down. In order to estimate approximately the strength of the spring desired for a particular case, the following technique has been worked out:

Fig. 4. — The power of the hamstring muscles is being determined with the Newman Myometer.

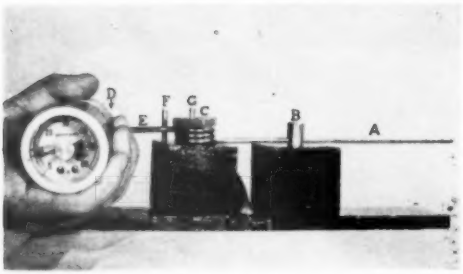

Fig. 5. — Block and fittings for mounting and measuring tension of coiled springs. Arm of spring A is secured in post B. The coiled part of the spring is secured by a threaded screw with a large knurled head C. The sliding attachment D is tightened against arm E of the spring with a set screw. It furnishes a base plate for pressure by the Myometer. When the arm of the spring E is at post F it is at an angle of 45 degrees, and when at G, it is at an angle of 90 degrees.

1. The patient is lying face down on a treatment table. His knee is flexed at about 90 degrees. With a Newman Myometer[1] or spring scale the leg is extended against maximum resistance offered by the patient (fig. 4). This furnishes an approximate estimate in pounds, as to the strength of the hamstrings.

2. A spring is mounted on a special block with a securing mechanism. Pressure is produced against the free arm of the spring until it is at right angles to the other arm, and read off in pounds (fig. 5). The correct tension of the spring in pounds, should be about half of the strength of the hamstrings, also measured in pounds.

Stating this differently, for practical considerations, the hamstring muscles have to be at least twice as strong as the spring, so that when they voluntarily contract, as in sitting down, they can easily overcome the tension of the spring and bring the knee from extension into flexion.

In standing or walking, the weight of the body (with or without the aid of the hamstrings), is able to cause various degrees of flexion in the knee, but the inherent tension of the spring, acting always in the same forward direction, brings the knee into full extension.

This procedure makes it possible to choose the right spring for the patient before it is fastened to the brace and eliminates wasteful trial and error methods.

1. A New Device for Measuring Muscle Strength, Arch. Phys. Med. 30:234 (April) 1949.

Acknowledgments. — We wish to express our thanks to the Medical Illustration Section (Mr. Robert E. David, Chief, and Mrs. Jeanette M. Whitehorn, Medical Artist), Veterans Administration Hospital, Fort Howard (Baltimore), Maryland, for the preparation of the illustrations.

INTRODUCTION TO PROBLEMS OF EDUCATION THERAPY *

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The importance of education in the training and retraining of the veteran in the post war period has been recognized through the passage of Public Law 346 (G. I. Bill of Rights) and Public Law 16. The educational benefits under these laws, however, cannot be offered to hospitalized veterans. Consequently, the Veterans Administration has inaugurated an educational therapy program which supplements (and in many cases augments) the educational benefits of the above stated laws without affecting the entitlement of a veteran under Public Law 346 and Public Law 16.[1]

The recognition that many hospitalized patients have ample time available leads to the logical step of offering the much needed educational program during their convalescence. Moreover, the provision of education is by necessity a basic feature in the therapeutic approach to total rehabilitation.

The Scope of Education Therapy

"Education Therapy," simply defined, "is the use on medical prescription of educational courses in the treatment of patients to assist in restoring them to the fullest mental and physical capacity compatible with their abilities and disabilities."[2] The scope of education therapy is divided into three major divisions: (1) diversional, (2) vocational, (3) direct therapeutic. Diversional educational therapy implies that a patient merely wishes to satisfy an educational desire. The subjects chosen by the patients are on a leisure time interest basis and do not necessarily involve any educational objective. Nevertheless, it frequently happens that such an approach leads to a distinct educational objective. A characteristic example of a diversional course of study is the current events discussion group, but actually any educational subject could be classified in this category.

Vocational aspects of education therapy generally deal with the following phases:

(*a*) *Retraining.* — Any person who has been absent from his vocation for some length of time because of military service or hospitalization often requires refresher training to regain his original knowledge and skills. Thus, for example, a former bookkeeper would register for courses in bookkeeping and accounting and other related subjects. When a student is hospitalized because of illness for a relatively short period, it often happens that he loses the training time during his hospitalization and is compelled to repeat his courses thereby losing a whole semester. Education therapy can bridge this

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Although the phrase "Education Therapy" is used throughout the paper, the term "Educational Therapy" is the official designation for this part of the rehabilitation program in the Veterans Administration.

* Reviewed in the Veterans Administration and published with the approval of the Chief Medical Director. The statements and conclusions published by the authors are the result of their own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

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1. Veterans Administration Circular, No. 131, May, 1946.
2. Veterans Administration Technical Bulletin 10 A-118, February 2, 1948.

gap by affording the patient a program that will maintain the continuity of his training.

(*b*) *New Training.* — In contrast to retraining, new training involves preparation for new vocational goals. Under such circumstances patients may be given the opportunity to utilize long term hospitalization to train for a higher level occupation although they could return to their former employment. On the other hand, the nature of certain disabilities may necessitate a change in occupation. The educational program is then adapted to the requirements of the changed occupation. For example, a patient unable to return to his previous occupation as a truck driver because of severely crippling arthritis was trained for the position of dispatcher with an express company. If possible, it is advisable to train the patient for jobs in the same industrial field so that he may be re-employed by his former firm. In very severe disabilities, such as paraplegia and multiple sclerosis, training for home bound industry should be carefully considered.

It is not desired to give the impression that a complete educational or vocational training can be given in the hospital. Much of the training needs to be accomplished after the patient leaves the hospital. However, in-hospital training will not only save time, but can be a considerable portion of the required training.

In-hospital training includes a wide diversity of educational preparation. In some instances a patient may have to finish high high school requirements before he can proceed to training at an advanced level. The high school diploma program is specifically designed to enable the patient to receive credit toward his high school diploma in the light of his educational and vocational objective. To illustrate, a patient interested in a business career will be enrolled in business courses such as Fundamentals of Typewriting and Merchandising Principles which will satisfy credits for his diploma and will also be an initiatory process towards his vocational objective. It should be emphasized that a high school diploma as such is not a vocational goal, but only the fulfillment of a requirement to enter definitive training. Therefore, it is advantageous to complete this program of study in the shortest possible time.

For other patients educational preparation may be directed towards the taking of courses for college credits. Such courses may be taken through the United States Armed Forces Institute, through other correspondence courses approved by the Veterans Administration, or special contract arrangement such as our hospital has with the Boston University General College. In the latter program under the supervision of the education therapy unit, patients, while hospitalized, may enter this college and complete with full credits two years of a college matriculation program. For some patients courses are designed as a direct vocational approach to prepare them for certain entrance examinations such as civil service, specialty schools, and large industrial concerns.

Fundamentally, all educational activities have therapeutic value. The therapeutic value of diversional education therapy is mainly in its psychological approach while vocational education therapy is inseparable from the total medical rehabilitation program. In some cases the main purpose for educational activity is for its direct therapeutic effect. For instance, the initial process in the development of work tolerance among tuberculosis patients is often begun with educational courses. Here, individual instruction methods are used because these patients are confined to their beds; but irrespective of its intended effect, educational courses may be carried on

through either individual or group instructional methods. Three examples of group activities, therapeutic in nature, at our hospital would be the music therapy group for psychotic patients, the mathematics class for aphasics conducted in conjunction with language therapy, and the psychology class for the severely handicapped.

The music therapy group is conducted as a music appreciation class in which group discussion follows the presentation of recorded music. The responses and reactions of patients in these sessions are carefully charted and analyzed. In addition to the therapeutic value, the observations made are also valuable for diagnostic and research purposes.

The therapeutic value of mathematics for aphasic patients arises from the intellectual restoration of brain function. In these patients with brain lesions the attempt of intellectual restoration is very similar to the process of physical rehabilitation; in both instances the objective is to awaken functions not lost but obscured by the injury and to restore function impaired by the lesion. The extent of the return is governed by the amount of brain damage. However, the limitations cannot be predicted until full use has been made of intellectual rehabilitation to a maximum level. As in the physical rehabilitation of patients with brain lesions, these authors have come to the conclusion that group activity can be successfully employed in education therapy among patients of different intellectual levels provided that there is awareness of the needs of the individuals composing the group.[3]

The psychology class for the severely handicapped is an excellent medium through which these patients can be aided in adjusting to their disability. Insight into the problems that confront them as handicapped individuals is the main objective of the course. Patients should be carefully selected and, if medically feasible, assigned to this course early in their convalescence. It is advisable, if not imperative, that the education therapy unit prepare this course in consultation with the psychiatric, psychological, and medical services.

Education therapy is not limited to any special diseases or disabilities. It can be profitably employed in a great variety of conditions in its diversion-

TABLE 1.

	Diversional	Vocational	Direct Therapeutic
Medical Conditions —			
Diseases of the heart	X	XX	XX
Diseases of the lungs, especially tuberculosis	X	XXX	XX
Diseases of the gastro-intestinal tract	X	X	
Metabolic diseases, especially diabetes	X	X	
Arthritis	X	XXX	X
Surgical Conditions —			
Post-operative recovery	X		
Orthepedic conditions	X	X	
Amputations	X	X	
Neurological Conditions —			
Poliomyelitis	X	XXX	X
Multiple sclerosis, et al	XX	(X)	
Hemiplegia	XX	(X)	
Aphasia	X	(X)	XXX
Paraplegia	X	XXX	XX
Neuropsychiatric Conditions	X	XX	XXX

XXX Greatest value of Education Therapy.
XX Marked value, but of secondary significance.
X Valuable adjunct.
(X) Questionable value.

3. Friedland, F., and Margolin, R. J.: Physical Rehabilitation of Patients with Brain Injury. Occupational Therapy and Rehabilitation, Vol. 26, No. 1, Feb., 1947.

al, vocational or direct therapeutic forms. Table 1 illustrates a number of indications for Education Therapy with their values.

Table 2 lists three groups of patients often considered non-feasible for any constructive activity because of their poor prognosis. Considering subjects such as current events discussion and forum activities rather than formal study, education therapy can serve the purpose of making these patients' lives more worthwhile. It is indicated in such a form especially for a selected group of patients who are not capable of accepting any other form of diversional treatment requiring physical exertion.

TABLE 2.

	Diversional	Vocational	Direct Therapeutic
The chronic invalid	X	X	
The domiciliary care patient	X		
The terminal care patient	X		X*

* Education Therapy is morale building and therefore direct therapeutic as a psychological treatment.

In the teaching procedure are two basic techniques of instruction, individual tutoring and group classes. There are certain recognized advantages to conducting group classes. When applicable, it is a great time saving device for the teaching staff, but its economic value is not its chief feature. The learning process of the individual is enhanced by the group situation, which acts as a strong motivating agent. Motivation is often difficult to maintain in a hospital because of the tremendous physical and emotional handicaps of the patient. In class activity, however, these handicaps appear to be diminished by the combined spirit of competition and inspiring acts of individual members. Thus, the class is conditioned to reach for a higher level of aspiration. In education therapy, the informal discussion method characteristic of these classes is desirable for all courses; it is imperative for such groups as current events and voice and diction. In addition to the educational value of group activity, the integration of the above mentioned factors inevitably induces a strong socializing effect.

Notwithstanding the advantages of classes, individual tutoring is necessary in singular situations and has its place in the total program. Because of the wide divergence of needs and interests, it often occurs that a single patient may request a course in an unusual subject and individual tutoring must be given. The same holds true for the more popular courses when at certain times only a single individual may request the course.

In certain conditions individual teaching may also be advisable because of the highly superior or greatly inferior intellectual level of the patient. In some cases discretion indicates the advisability or necessity of individual teaching, for example, where the emotional instability of the patient may be a disrupting factor to the group. Finally, the importance of individual tutoring for the bedridden patient must not be overlooked. In fact, education therapy for the confined patient constitutes a major portion of the total program.

Educational Foundations

Education therapy is by no means different from any other learning process, deriving its impetus from the dynamic drives characteristic of human adjustment. Recent education theory confirms the concept of the continuity of the learning process from birth to death. In our own experience, favorable results in education therapy have demonstrated that learning is

possible at any age level. This is extremely significant for the disabled veteran, where the problem of re-education is a serious one. The acceptance of education therapy is determined by three fundamental motivating forces — self motivation, motivation by opportunity, and induced motivation. Self motivation is exemplified by the patient who could not satisfy an educational need of long standing prior to hospitalization because he lacked the time and now is able to do so. Through motivation by opportunity patients are attracted who previously were unaware of the need or the advantages of educational advancement until stimulated through opportunities provided by education therapy. Induced motivation is applied to reach a group of severely disabled patients who do not realize that their vocational future is limited by their disability and is mainly dependent upon adequate educational retraining. Frequently, patients in the latter group lose interest in spite of repeated encouragement by staff members and consequently their educational prognosis is less favorable than those of the other groups.

Whatever the motivation may be, learning is improved when the student feels responsible for his education. When an individual is imbued with a strong drive, namely, motive and purpose, then the best learning situation is present. This is especially evident among adults who generally do not undertake such experiences unless they have an appreciation of the need for studying. Education therapy must be geared to the interests, needs, and problems of the patients.

It logically follows that in education therapy the tempo of learning is adjusted to the potentialities of the patient. Such a procedure is conducive to learning, because it minimizes the frustration element often seen in programs not adjusted to the capabilities of the students. In the last analysis, only the student determines what can be learned. Thus, time limits are not set for any particular course of study. Programs can be short term or long term. One of the more important lessons garnered from our war-time training is that educational training programs can be considerably accelerated. Similarly, if need arises, education therapy can condense over a relatively short period courses which may take much longer in the ordinary school setup. Such need presents itself where the student is a short term patient or when a vocational opportunity is available in the immediate future and requires preliminary intensified preparation.

If the needs, interests, and problems of patients are to be satisfied in education therapy, it must cover every conceivable subject — business, academic, and technical. Also, if education therapy is to reach all types of individuals it must be capable of employing diverse educational methods. It certainly cannot be expected to have all the different types of educational aids available in a hospital; therefore improvisation becomes a prominent technique employed by the instructional staff. Under such circumstances constant readjustment of teaching technique and of program is possible. Implicit is a flexibility of program which would enable a change to another program if the original choice should prove to be inappropriate. In contrast to the relative rigidity of the traditional school system this flexibility not only provides a beneficial therapeutic effect, but it also can be experimentally valuable for research in the educational field.

Careful observation has led to the conclusion that informal teaching procedures create an emotional climate conducive to enhanced learning. The informal atmosphere removes the feeling of pressure that is often characteristic of the usual school situation. The total rehabilitation of the individual personality is the chief concern of education therapy. In the light of this

fact, achievement of emotional relaxation and stability assumes priority over subject matter; in other words, these patients must be regarded as individuals with personal problems, and education therapy as one of the channels through which assistance may be given in the resolution of these problems.

Whatever objectives in education therapy are established with the patients, the integration of the didactic approach with the practical is a recommended procedure whenever possible. In a hospital situation experimental learning should be identical with a normal way of mature life. There is, thus, a sort of implicit dualism in the learning process whereby patients learn certain things by doing and at the same time learn their conceptual basis through abstract thinking. To illustrate this principle, a student interested in radio repair and servicing must have a fundamental academic background, such as mathematics and physics essential for radio. This teaching should then be augmented by coordination with other therapeutic sections dealing with the manual and practical application of the subject. Non-serviceable old radios can easily be secured through contribution, or small radio kits can be bought inexpensively. Thus a wealth of material and instructional and training aids becomes available to implement an effective curriculum.

Education Therapist

In education therapy, as in any other discipline, the quality of the program is dependent upon the number of teachers available and their ability to develop an effective curriculum. Basically, the full time staff represents the core of the teaching personnel. Because of budgetary reasons it may not be possible to employ a complete staff of education therapists under the customary hospital set-up. Therefore, to assure a well rounded program, the staff must be augmented by volunteers. However, it is of extreme importance that such volunteers have the same basic teaching qualifications as the staff therpists and that they be well oriented towards the program before participating.

Volunteer teachers are selected from various sources. In Veterans Administration hospitals recruitment is carried on mainly through the services of the Red Cross and the various service organizations. However, when such services are not available, volunteer teachers can be secured by directly approaching suitable candidates in the community. The groups from which volunteers are chosen include the following:

1. Former women teachers who left the profession because of marriage.
2. Former teachers that are now employed in other occupations.
3. Individuals who have certain professional and occupational specialties.
4. Teachers with altruistic motives.
5. College students training for the teaching profession.
6. Hospital patients with special skills.

With proper orientation the volunteer teachers can be given specific responsibilities under the direct supervision of the Chief Education Therapist. However, to maintain the scope and continuity of the program, certain obligations must rest with the full time staff. In addition to teaching, these obligations include such various administrative and professional functions as interviewing and registering patients for courses, observing and recording their progress, corresponding with schools and state educational departments, obtaining adequate materials and supplies for teaching purposes, coordinating education therapy with all other functions of the hospital, and supervising the volunteer staff.

All teachers (staff and volunteers) must meet certain basic qualifications. Because of the complexity of the program the teachers must have a good educational background in their field; they must be capable of teaching other people, a capability which develops as a result of teaching experience or from the highly skilled nature of their professional practice, and from an ability to be aware of and to utilize properly the interpersonal and group factors in the learning situation. Fundamental to the success of education therapy is the patience and the enthusiasm with which the program is carried out. Faith and conviction, ability to observe, and good judgment are equally essential because there are many heart-breaking problems to be faced in the teaching of hospitalized patients.

Education Therapy and Adult Education

As a result of the complexities of modern living, its social as well as its vocational aspects, there has been a gradual recognition that adult education must play a major role in community life. It stands to reason that a hospital, vital community agency that it is, should carry the responsibility of providing continuity in adult education activity for its resident patients. From this point of view, education therapy is an integral aspect of adult education.

Adult education has been defined by the joint committee of the American Association for Adult Education and the Department of Adult Education of the National Education Association as "educational work designed to help adults to locate and learn to solve their personal or social problems."[4] This implies that adult education is by no means limited to any special age group. At present the predominant emphasis of adult education is upon those age groups up to fifty years of age. However, of increasing importance is the development of educational programs to deal with the problems of the aged. The authors subscribe to the viewpoint presented by Galen Jones, Director, Division of Elementary and Secondary Schools, U. S. Office of Education[5]:

> . . . . Considering only occupational and economic problems, persons over fifty offer the educational institutions of the country a great challenge. They especially need help in making vocational readjustments and in retraining. From other viewpoints, too — citizenship, leisure-time, family living, and health — this age group offers a challenge. In fact, the orientation of our entire culture to the actualities and potentialities of a new age structure in our population awaits major assistance from the schools [and other educative agencies].

It is obvious that the objectives and problems of adult education as stated above are identical with those of education therapy in a hospital. Education therapy for children of school age need not be elaborated upon since incorporating the school in the hospitals and institutions for crippled and disabled children has always been an accepted practice. Likewise, the acceptance of the continuity of education explains the importance for education therapy activities which should be available to all age groups — the old as well as the young adult. To facilitate the realization of these objectives, competent leadership is necessary.

> Leadership in adult education [in a hospital or any other community agency] necessitates teamwork. None of us can work effectively alone.

4. Adult Education. Vol. I, No. 1, October, 1950, p. 6.
5. Federal Security Agency, Office of Education: Education for a Long and Useful Life. Bulletin No. 6, 1950.

> Teamwork on the local, state, national, and international levels must be further developed. We must learn the best ways of working together.[6]

Here there is an indication that there should be greater cooperation and integration between education therapy and outside adult education agencies. It is not always possible for a patient to complete his educational objective in the hospital. Like any other medical care which is divided into hospital treatment and outpatient or home care, education therapy in its long-range aspect must continue after the discharge of the patient. Thus, the adult educational facilities in the community must be introduced to the therapeutic problems of the patient so that these facilities can carry the educational therapy program to its logical conclusion. This emphasizes the need for proper liaison between hospitals and other educational agencies in the community. In the Veterans Administration the regional offices throughout the country carry the responsibility for such liaison services.

Summary

An attempt has been made to introduce some of the major problems of education therapy. The diversional, therapeutic and vocational aspects of education therapy have been discussed, and its relationship to adult education has been emphasized. It is recognized that in this paper some of the problems of education therapy have been mentioned only briefly and should be further elaborated. It is planned to clarify and define all the important problems in subsequent articles. It is hoped that education therapy has been demonstrated to be feasible as well as desirable in all hospitals and is not limited to Veterans Administration and military hospitals.

6. Preston, Everett C.: Adult Education, Vol. I, No. 1, October, 1950.

DIATHERMY GENERATORS

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This paper presents some of the work of the National Bureau of Standards on diathermy generators, the preparation of purchase specifications and the examination and testing of diathermy generators for compliance with specifications. After much effort on the part of manufacturers, users, radio consultants and some government agencies, this work led to the development by the diathermy manufacturers of crystal-controlled machines which operate at specific frequencies assigned by the Federal Communications Commission in accordance with regulations proposed by the International Telecommunications Union in 1947. Diathermy interference with communications has accordingly been greatly reduced. Some of the factors involved in this accomplishment are given.

Chronological Résumé

A diathermy, short-wave, or ultra-short-wave generator, as used in electrotherapeutics, consists of a small radio oscillator or generating set which operates in one or more frequency bands. The oscillator circuit employed may be one of the well-known circuits such as the Hartley, Colpitts, or one selected as suitable by a given manufacturer. The power unit may provide unrectified alternating current plate voltage or rectified plate voltage with more or less filtering. Equipped with treatment electrodes and electric cord for connection to the usual 115-volt power line, the device is a small radio transmitter capable of producing interference with radio communication services. Until recently the Federal Communications Commission has had no regulatory powers over the manufacturers and users of these devices, except during World War II when all diathermy generators in this country were required to be registered with the Federal Communications Commission.

A later development was the high-frequency wattmeter[1-2-3-4] for use as a precise indicator of the amount of r-f power applied in a given clinical application. It has been pointed out[5] that while this instrument may function satisfactorily, it is not clinically advisable to treat similar cases with the same output reading, as there are many factors other than power output which the physician must take into account in giving treatment.

As an example of the variation in power output required for treating different parts of the body, the following table is given of values obtained by measurement with a high-frequency wattmeter. Impedances of the body vary with the portion treated, the method of electrode application, the individual, and the frequency, and may range from three to a hundred ohms.[6]

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1. Mittelmann, E.: Dosimetry in Short Wave Therapy, Arch. Phys. Therapy **18**:613, 1937.
2. Mittelmann, E., and Kobak, P.: Dosage Measurement in Short Wave Diathermy, Arch. Phys. Therapy **19**:725, 1938; Electronics **12**:52, 1939.
3. Mittelmann, E., and Holmquest, H. J.: The Useful Power Output of Short Wave Diathermy Apparatus, Quart. Bull. Northwestern University Medical School **14**:172, 1940.
4. Osborne, S. L., and Holmquest, H. J.: Technique of Electrotherapy, C. A. Thomas, Springfield, Ill., 1944, p. 460.
5. Schmitt, M. G.: Optimal Dosage in Short Wave Diathermy, Arch. Phys. Ther. **21**:716, 1940.
6. Gieringer, C. K.: Short-Wave Diathermy Apparatus and Frequency-Control Possibilities, Elec. Eng. **59**:429, 1940.

Total Power Input Measured with a High-Frequency Wattmeter

Treatment	Application	Watts
Head	12-inch Disk	20-35
Chest	12-inch Disk	35-70
Pelvis	12-inch Disk	50-75
Back (Lumbar)	3-turn Pancake	45-85
Lower Extremity	Long Single Loop	80-110

Diathermy or short-wave generators have the undesirable characteristic of causing interference[7-9] with radio communications. Most machines of this kind were constructed to operate at some frequency in the range from about 10 to 50 megacycles (Mc.) with the majority operating around 17 megacycles. The frequency of operation varied considerably from one machine to another but means were available for obtaining satisfactory clinical operation. The frequency of operation was affected by the type and position of the applicators upon the patient's body. Breathing of the patient often periodically altered the relative positions of the electrodes and caused the output frequency to vary back and forth across a considerable frequency range in step with the patient's breathing. The patient's electrodes had two leads three or four feet long, or a cable ten to twelve feet long. The oscillator was not shielded, often being in a wooden cabinet, and r-f filters on the power line were unknown. While the combination represented a poor radio transmitter and antenna, these devices were responsible at times for much interference with urgent radio reception and annoyance in reception of television and other programs. Interference was not confined to local areas alone but was at times distributed to great distances[10] by the electric power lines. The situation became so bad that in 1939 the Federal Communications Commission called a conference in New York City of physicians, diathermy manufacturers, radio engineers and other interested parties to consider what should be done to alleviate the interference.

The right of the physicians to employ this means of treating human ills was recognized by the Federal Communications Commission as well as the fact that intolerable radio interference was being caused by these electromedical devices. The interference could be overcome in two ways, by shielding the diathermy treating room, or by assigning specific frequencies for operation of these devices and moving other radio services from these bands. The Government of Canada assigned 13,660 kc and its second and third harmonics for this service. The shielding proposal was considered too expensive, as well as impractical for hospital use.

The next year (1940) a conference was held in Washington at which suitable frequencies for diathermy use were stated by the physicians and diathermy manufacturers. The latter agreed to build diathermy generators with a frequency tolerance of 0.5 per cent, but felt that the reduction of this tolerance would result in greatly increased cost of the machine. Crystal control was advocated as a means of maintaining frequency within the narrow limits demanded by the crowded frequency spectrum. Since crystal control was used on broadcast and communications transmitters, it was argued that diathermy generators should be similarly controlled. A frequency tolerance

7. Krusen, F. H.; MacEachern, M. T.; Desjardins, A. U., and Mathis, A. W.: Medical Viewpoint of Interference with Radio Reception by Electro-Medical Equipment, Arch. Phys. Ther. 20:261 (May) 1939.
8. Jett, E. K.: Radio Interference Problems from Operation of Electro-Medical Apparatus, Arch. Phys. Ther. 21:655 (Nov.) 1940.
9. Radio Interference from Electro-Medical Apparatus, Radio Craft 12:627 (Apr.) 1941.
10. Interference Source Discovered, Electronics 9:19 (Feb.) 1936.

of 0.05 per cent was suggested by the Federal Communications Commission.

A special committee was set up in 1941 to determine what frequency tolerance was possible both from the clinical and an engineering standpoint. Several diathermy generator manufacturers agreed to submit experimental machines to hold frequency to 0.5 per cent. The Council on Physical Therapy (now Council on Physical Medicine and Rehabilitation) of the American Medical Association agreed to test the generators for their adequacy in clinical operation. The National Bureau of Standards agreed to make tests to determine the frequency tolerance in customary operation and other characteristics. Frequencies of 13,660, 27,320 and 40,980 kilocycles were tentatively assigned for these tests.

The tests at the National Bureau of Standards were made in cooperation with a representative of the Council on Physical Medicine and Rehabilitation who arranged with the Director of the Physical Therapy Department, Walter Reed General Hospital, for the assistance of a physician, a physical therapist, and a subject. Treatment electrodes were applied to the subject using several customary techniques, and the frequency of the generator was measured. All dial settings and meter readings of the diathermy generator were recorded for further use. All machines submitted (six for a frequency tolerance of 0.5 per cent and three for 0.05 per cent using crystal control) met the therapeutic and electrical requirements for which they were designed. It was thus demonstrated that diathermy generators could be constructed to maintain frequency within 0.05 per cent for all types of customary treatment. These machines were experimental models and did not yield cost information, which for crystal controlled models had been claimed to be two or three times that of the ordinary machines. Experimental work at this time was handicapped by scarcity of strategic materials and components.

The Surgeon General, U. S. Army, requested assistance of the National Bureau of Standards in the preparation of a purchase specification for diathermy generators for Army use. The specification developed was noteworthy in that it required operation at definite prescribed frequencies with minimum tolerance as suggested by the Federal Communications Commission. The only practicable way in which these requirements could be met was by the use of crystal-controlled generators such as had been demonstrated to be feasible. A large number of diathermy generators was purchased for operation at 13,660 kilocycles.

The Federal Specifications Board submitted a proposed federal specification for diathermy generators, which followed the army specification very closely. This was issued January 21, 1943, as "Federal Specification for Diathermy Apparatus; Short-Wave," W-D-286. Because of the war, procurement of diathermy generators from these specifications was limited to the Armed Services.

During the war the Federal Communications Commission was urged by some manufacturers of diathermy equipment, industrial heating equipment, and other radio-operated devices to assign frequencies such as those already being used, but with much larger tolerances. Other manufacturers questioned the legality of the Commission's insistence on close frequency control of diathermy or other services not used in radio communications.

After holding public hearings, the Federal Communications Commission in 1946 promulgated regulations relating to the operation of medical diathermy and industrial heating equipment. These regulations provided for type

approval of a manufacturer's diathermy model following successful passing of certain tests conducted by the Federal Communications Commission. A number of such type approvals were made.

In 1947, the International Telecommunication and Radio Conferences at Atlantic City reassigned frequencies on a world-wide basis. The reassignment shifted frequencies for diathermy and other uses somewhat. The frequencies based on 13,660 kilocycles, in use in Canada and the United States, were shifted to 13,560, 27,120 and 40,680 kilocycles, with permissible deviations of ±0.05, ±0.6, and ±0.05 per cent, respectively. The Federal Communications Commission issued regulations[11] making these frequencies and tolerances mandatory by June 30, 1952, unless a machine was to be operated within a special screened enclosure. In such a case certain tests were prescribed to insure that radiation at any frequency would not exceed an electric field of 15 microvolts per meter at a distance of 1,000 feet. A station license is required for such operation. No license is required for operation of machines having type approval.

In order to satisfy certain objections raised in public hearings preceding the adoption of the rules and regulations, the Federal Communications Commission's laboratory at Laurel, Maryland, designed and built a diathermy generator[12] meeting the requirements of the new regulations. The unit was built for operation at 27.32 megacycles using an electron-coupled power oscillator. Economy and simplicity were important considerations in its design. Tests by the Council on Physical Medicine and Rehabilitation indicated satisfactory therapeutic performance but the power output was approximately 25 per cent lower than the federal specification.

During World War II the Army procured about 3,000 diathermy units, the Veterans Administration about 200 units, and some 500 units were sent abroad under the Lend-Lease plan. The Army units were used in its hospitals here and abroad. Following the war the Army diathermy units were returned from field hospitals, and several hundred were taken by the Navy and the Veterans Administration and some state rehabilitation centers on a surplus disposal program. These machines had given reliable service except for tube failures and slight electrical adjustments. Tubes produced since the war have been practically free from failures for the normal life of the tube. Some of the troubles such as tube failures and the readjustments were caused by rough handling of tubes and machines. The Army was left with about a million dollars worth of first-class diathermy equipment declared to be unlawful after June 30, 1952, in its present condition. In 1949 the Department of the Army accordingly undertook an investigation of the possibility of modification of these diathermy units to comply with the new Federal Communications Commission regulations. The Federal Communications Commission and the National Bureau of Standards cooperated with the Department of the Army. Modification of a sample machine by Federal Communications Commission engineers demonstrated the feasibility of technical changes to enable the machine to meet the new requirements. Relatively few new parts are necessary, but considerable time is required for mechanical and electrical changes. If Army technicians do the work, it appears that the Army's salvage program would save a large sum by modifying the present units instead of purchasing new ones.

11. Federal Communications Commission Rules and Regulations, Part 18. Rules and Regulations Relating to Industrial, Scientific, and Medical Service. Effective June 30, 1947.
12. Chapin, E. W.; Roberts, W. K., and Mobley, M. C.: FCC Diathermy Design for Low-Harmonic Radiation and Good Frequency Stability, Trans. AIEE 67:42, 1948.

The same modification plans could be used by the Department of the Navy, which could save a proportional amount. It is understood that the Veterans Administration expects to have their radio technicians make the necessary modifications so that the present machines will comply with the new rulings.

Testing of Diathermy Generators

Upon receipt in 1938 of the first request for examination and test of diathermy generators for compliance with purchase specifications, it became necessary to establish test facilities and procedures. Determination of the adequacy of such generators from a clinical standpoint was outside the scope of the Bureau. As advertising emphasis at this time was upon the power output and not the frequency, instrumentation for high-frequency measurement up to 500 watts at 50 megacycles was required. Three methods of power adequacy measurement were in use at this time: (a) A method using a living subject as carried out by the Council on Physical Therapy (now Council on Physical Medicine and Rehabilitation); (b) a calorimeter method involving the temperature rise in a container of saline solution as used by the Department of Hospitals of the City of New York[13]; (c) a photoelectric lamp-load method, often used in measurements of the power output of radio transmitters[14-15] because of its simplicity, and also used by The Department of Hospitals of the City of New York. A fourth possibility was the familiar I^2R method, for which so many objections could be cited, that, although tried experimentally because of use by one of the manufacturers, it was not considered suitable.

Method (a), as conducted by the Council on Physical Therapy, requires the services of a surgeon and several healthy subjects. In this method[16] a cannula is introduced at the midpoint of the anterior surface of the thigh, and inserted about two inches. A thermocouple is placed in the cannula and temperature readings are taken before and after a twenty-minute diathermy application. A final temperature of 104 degrees F. is required. Tests are made using the various electrodes supplied with a given machine.

Method (a) is expensive, time-consuming, also painful and inconvenient for the subjects, but does demonstrate the ability of the machine to raise the body temperature. Cognizance of these undesirable features is perhaps indicated by the fact that now the Council also accepts data taken using methods (b) and (c), when conducted under certain conditions.

Method (b) could be made to give high accuracy in results, but the time required was found to be excessive. A calorimeter method[3] was suggested as giving a better indication of the heating ability of the diathermy machine than method (c). The calorimeter "phantom" usually consisted of a cylindrical or rectangular glass container holding 4 liters of a 0.25 per cent sodium chloride solution which is reported to have an impedance similar to the body. However, such a homogeneous solution does not resemble a cross-section of the human body containing many types of tissues such as fat, muscle, tendons, bone, with blood and other liquids.

A phantom containing two liquids in separate concentric cylinders was

13. Titus, Norman E.: Technical Problems of Short Wave Diathermy, Arch. Phys. Therapy **19**:690 (Nov.) 1938.
14. Pession, G., and Gorio, T.: Measurement of Power and Efficiency of Radio Transmitting Apparatus, Proc. IRE **19**:377, 1931.
15. Taylor, A. H.: Measurement of Radio-Frequency Power, Proc. IRE **24**:1342, 1936.
16. Beard, Gertrude: Short Wave Medical Diathermy, Physiotherapy Review **16**:3, 1936.

described later[17] and appears to be a better substitute. The outer cylinder contained a vegetable oil and the inner cylinder the salt solution. This form and the overall dimensions were intended to approximate the human adult thigh with its outer fatty tissue. As authorities agree that the chief function of short-wave diathermy treatment is the production of heat deep within the body, the treatment method used should be such as to produce this result. When the induction cable was wound about the phantom and a frequency of about 12 megacycles[17] used, it was found that the inner cylinder of salt solution showed twice the temperature rise in 20 minutes as the outer cylinder of oil. When the space plates (electric field) were used, the outer cylinder of oil showed three times the temperature rise in 20 minutes as did the inner salt solution. This experiment showed that the electromagnetic field (cable technique) produced the greatest temperature rise in the central portion of the phantom corresponding to the vascular tissues. Using the electric field (space plate technique) greater heat was produced in the outer portion of the phantom, corresponding to the fatty tissues. It was accordingly stated that in clinical use the cable technique with the lower frequency would produce greater internal heating and less surface heating, and that the pad or space plate technique would produce less internal heating and more surface heating. The latter would indicate a greater possibility of producing surface burns or blisters because of perspiration. Space plate technique will give deep tissue heating if correctly applied,[18] but the cable technique is preferred, as it is simplest and is less liable to produce burns.

Method (c) appeared desirable for use by the National Bureau of Standards because it was given as the test method in the purchase specification, was convenient, quickly done, and believed to be of adequate accuracy. As previously mentioned it was one of the two test methods then in use by the Department of Hospitals of the City of New York.[13] There an output of 300 watts was required as demonstrated by brilliant lighting of two calibrated 150-watt, 32-volt incandescent lamps in parallel. This represented a load of about 3.4 ohms. This general method was adopted by the National Bureau of Standards.

The method has its critics, who deny the efficacy of lamp load tests as an indicator of a diathermy generator's worth. They[2] point out that many diathermy generators are made with an output impedance near that of the larger 115-volt light bulbs, while the body impedances for many kinds of treatment are much lower. A machine designed with a lower output impedance might be more efficient in clinical operation, yet be rejected because of failure to meet a given power output beyond its range, based upon incandescent lamp tests. To overcome this objection, the National Bureau of Standards selected some other lamp loads having lower impedances than the 115-volt types. Lamp loads used at the National Bureau of Standards for a 200-watt output were as follows:

Lamp Rating		No. of Lamps	Connection	Load Impedance at 60 c/s, Ohms
Watts	Volts			
100	32	2	Parallel	5
100	32	2	Series	20
300	115	1	.....	37
200	115	1	.....	65

17. Holmquest, H. J., and Mittelmann, E.: A Physical Method of Determining the Useful Output of Short Wave Diathermy Apparatus, Quart. Bull., Northwestern Univ. Med. School 15:255, 1941. Technique of Electrotherapy, p. 471.

18. Coulter, John S., and Osborne, S. L.: Physiologic and Clinical Effects of Short Wave Diathermy, Jour. Med. Cincinnati 18:283 (Aug.) 1937.

Some diathermy machines will light a 300-watt, 115-volt lamp to full brilliancy, while another smaller machine might not light the lamp more than a dull red. Thus the prospective purchaser might be led to believe that the larger machine was the better product because of superior power. It is probable that the larger machine could furnish much more power than a patient could tolerate, although perhaps not as efficiently; as this question has not yet received much attention.

The first tests at the National Bureau of Standards in 1938 required that outputs of about 500 watts at 50 megacycles be demonstrated by a photoelectric method. A 500-watt, 115-volt incandescent lamp was debased and used for the load. A suitable photoelectric cell* was used to indicate the light intensity of the lamp on a direct-current microammeter. The microammeter was calibrated in terms of known 60-cycle power applied to the lamp. The lamp was then coupled to the patient circuit of the diathermy generator and the power expended in the load was determined. Magnetic coupling was used in the case of the cable and drum applicators, a 3-turn spiral coil being connected to the lamp terminals. Electrostatic coupling was used for the pad and space plate applicators. Each pad or space plate was mounted directly above a flat metal plate fastened on insulators and connected to the lamp terminals. A variable air condenser was found to be advantageous in the load circuit when testing some applicators. Since in clinical use the various applicators are separated from the body by toweling, felt spacers, or otherwise, the tests were conducted with several spacings between the applicators and the pick-up circuit.

The use of calibrated incandescent light bulbs as a load for measurement of a few hundred watts of output is subject to technical difficulty and possibilities of error. The error will increase as the frequency and the inductive reactance are increased. For example, the use of a 500-watt, 115-volt incandescent lamp to show a 500-watt output at the order of 50 megacycles is quite difficult practically and liable to large error. The diameter and length of filament wire required are such as may result in unequal heating of part of the filament at 50 megacycles. While the photoelectric cell is located several feet distant and the overall light intensity is not appreciably affected, the formation of a current maximum may alter the calibration by causing the filament to sag, or even to destroy the filament or a heavy lead wire to the filament. If the frequency is reduced to 13 magacycles the difficulty and errors mentioned above are much reduced. If the power is also reduced to 200 watts, the use of several types of incandescent lamps is possible. For lower power it is possible to obtain several impedance values which compare favorably with impedances measured for various parts of the body. Some low impedances can thus be set up, for which a prescribed minimum output, such as 200 watts, can not be demonstrated on some machines. Since the body cannot tolerate such power, there may be a question as to the reason for setting the power requirement even this high. Power output of 150 to 200 watts is desirable for fever therapy.[19] Also it was felt that the machine should be more than adequate to perform satisfactorily eight hours per day in government clinics and hospitals without failure. Reduction in power requirements might open the way for irresponsible persons to manufacture machines of inadequate performance, servicing, parts replacement and other

* At least two companies manufacture a photoelectric cell which will operate the meter mentioned without an amplifier.

19. Osborne, and Holmquest: Technique of Electrotherapy, C. A. Thomas, Springfield, Ill., 1944, p. 445.

features. The enactment of the Federal Communications Commission rules has perhaps removed some of these considerations.

The requirement of several sets of incandescent lamp bulbs of various impedances led to the provision of interchangeable lamp mountings in a convenient form for the test. Each bulb was debased and mounted horizontally on a small wood base which could be placed at a given point between suitable retaining blocks. The wire leads of the bulb had soldering lugs attached that could readily be placed under a binding-post assembly, to which one of several interchangeable loops of wire were fastened. The photoelectric cell was in line with the light bulb and at such a distance that the direct-current meter would give a large deflection for any lamp load of 200 watts. A lamp bulb could be calibrated, be removed, and be replaced without altering its calibration. This was convenient, rapid, and permitted all bulb combinations to be calibrated consecutively before testing the diathermy generator. For most tests the maximum output of the generator was not determined as long as it exceeded the requirement of the specification.

Frequency stability tests were of great importance during some of the earlier tests mentioned above. Measurements during clinical applications of various treatment electrodes were made with a heterodyne frequency meter. This instrument was used to measure the change in frequency when a machine was operated for an extended time on lamp load.

A limited number of measurements on the harmonic frequencies of seven diathermy generators were made in 1941 for the Federal Communications Commission. The generators operated into a lamp load with adjustments to give meter readings such as observed in clinical tests previously recorded. Using a closely coupled sensitive indicator, harmonics up to about 300 megacycles were found on two generators, up to 164 megacycles on one, up to 137 megacycles on three, and up to 96 megacycles on one. Field intensities were measured for one condition for harmonics up to 122 megacycles, which was the limit of the measuring equipment then available. These measurements tended to verify complaints which had been made of diathermy interference at many frequencies.

The Federal Communications Commission regulations becoming effective July 1, 1952, place a limit for harmonic outputs of 25 microvolts per meter at a distance of 1,000 feet or more. For the Federal Communications Commission type tests the diathermy generator is placed on a turntable so that the field in all directions from the generator can be readily measured. Excessive harmonic radiation can, of course, be eliminated by simple changes within the generator, which also reduce the power output so that the machine may no longer be effective for its intended clinical use. The Council's approval would be based upon the normal power output.

In the work previously done for the Federal Communications Commission the diathermy generators were first submitted to and found to be adequate clinically by officials of the Council on Physical Therapy, A. M. A., before being subjected to radio tests at the Bureau. Earlier, type tests on radio station frequency monitors[29] made by the Bureau for the Federal Communications Commission were undertaken only on units adjusted by the manufacturer to show a station frequency of 1500 kc correctly. This pro-

29. George W. D.: The Testing of Frequency Monitors for the Federal Radio Commission, Proc. IRE 22:449, 1934.

cedure demonstrated the manufacturer's ability to accurately adjust his product to the desired frequency. In one case, use of the Bureau's standard for adjusting an instrument to frequency was requested but was not given on the basis that if an accurate frequency adjustment were lacking on the sample brought to the Bureau, instruments sold to broadcast stations might not be accurately adjusted.

In order to protect both manufacturer and user, type approval should be considered only for a manufacturer whose machine has been tested and proved adequate in clinical operation. Then, without alterations of any kind, it should be operated at maximum output and tested for compliance with radio regulations. A machine meeting these requirements would be given type approval. All machines constructed in accordance with that particular type would be expected to be free of undesired radiation and be clinically adequate. The 200-watt output representing a "factor-of-safety" of 2 to 5 or larger in the tests versus most clinical use would further safeguard and reduce probability of interference by hospitals, clinics, and private physicians employing these machines.

It is noteworthy that the reduction or elimination of interference from medical diathermy generators, together with promulgation of a Federal specification, have been accomplished through cooperative efforts by a number of groups including the physicians or users of the generators (Council on Physical Medicine and Rehabilitation), certain manufacturers of diathermy equipment, and numerous government agencies such as the Federal Communications Commission, Physical Therapy Department of Walter Reed General Hospital, former Procurement Division of the Treasury Department, Veterans Administration, The Surgeon General's Office, Federal Specifications Board and National Bureau of Standards.

ARCHIVES of PHYSICAL MEDICINE

OFFICIAL PUBLICATION AMERICAN CONGRESS OF PHYSICAL MEDICINE

.·. EDITORIAL .·.

AMERICAN BOARD OF PHYSICAL MEDICINE AND REHABILITATION

The next examinations for the American Board of Physical Medicine and Rehabilitation will be held in Chicago, June 8 and 9, 1952. The final date for filing applications is March 31, 1952. Applications for eligibility to the examinations should be mailed to the Secretary, Dr. Robert L. Bennett, Georgia Warm Springs Foundation, Warm Springs, Georgia.

ETHICAL RELATIONSHIPS BETWEEN PHYSIATRISTS AND INSTITUTIONS

For several years, various committees of the American Medical Association and the Board of Trustees of that association have been giving careful study to the relationships between hospitals and other institutions on the one hand and certain groups of physicians on the other hand. The groups of physicians particularly involved in these studies have included not only the specialists in physical medicine but also specialists in clinical pathology, roentgenology and anesthesiology. After prolonged study, the Board of Trustees of the American Medical Association recommended that there be substituted for all previous reports a new report which should serve as a guide for the conduct of physicians in relationships with institutions.

At the meeting of the House of Delegates of the American Medical Association held in Los Angeles in conjunction with the clinical session of that association in December, 1951, this statement was approved unanimously.[1] It is of such great importance in guiding physiatrists in their relationships with institutions that it seems wise to publish the statement herewith in full. It reads as follows:

"Guides for conduct of physicians in relationships with institutions.

'So far as it can be determined on the basis of study made by the Bureau of Legal Medicine and Legislation of the American Medical Association, as a matter of law the corporate practice of medicine is illegal in most states. In almost all instances the classic example given by the courts of the type of corporate practice of a profession that is illegal is the instance in which a corporation hires a professional man and then sells his services to the public on a fee basis for the profit of the corporation. Such exceptions as there are refer to statutory legislation in several states permitting certain modifications of this general law. It must also be remembered that fee splitting with a corporation is just as unethical as fee splitting with another physician.

'In addition to being guided by the laws of the various states, physicians in their relationships with hospitals must be guided by the Principles of Medical Ethics of the American Medical Association. Those sections of the Principles which have a distinct bearing on these relationships are as follows:

1. Report of Reference Committee on Hygiene and Public Health, J. A. M. A. 147:1684 (Dec. 22) 1951.

'Chapter I, Sec. 3. 'Groups and Clinics. — The ethical principles actuating and governing a group or clinic are exactly the same as those applicable to the individual. As a group or clinic is composed of individual physicians, each of whom, whether employer, employee or partner, is subject to the principles of ethics herein elaborated, the uniting into a business or professional organization does not relieve them either individually or as a group from the obligation they assume when entering the profession.'

'Chapter III, Article VI, Sec. 2. 'Conditions of Medical Practice. — A physician should not dispose of his service under conditions that make it impossible to render adequate service to his patients, except under circumstances in which the patients concerned might be deprived of immediately necessary care.'

'Chapter III, Article VI, Sec. 3. 'Contract Practice. — Contract practice as applied to medicine means the practice of medicine under an agreement between a physician or a group of physicians, as principals or agents, and a corporation, organization, political subdivision or individual, whereby partial or full medical services are provided for a group or class of individuals on the basis of a fee schedule, or for a salary or for a fixed rate per capita.

'Contract practice *per se* is not unethical. Contract practice is unethical if it permits of features or conditions that are declared unethical in these Principles of Medical Ethics or if the contract or any of its provisions causes deterioration of the quality of the medical services rendered.'

'Chapter III, Article VI, Sec. 6. 'Purveyal of Medical Service. — A physician should not dispose of his professional attainments or services to any hospital, lay body, organization, group or individual, by whatever name called, or however organized, under terms or conditions which permit exploitation of the services of the physician for the financial profit of the agency concerned. Such a procedure is beneath the dignity of professional practice and is harmful alike to the profession of medicine and the welfare of the people.'

'In conclusion, the Principles of Medical Ethics states: 'These principles of medical ethics have been and are set down primarily for the good of the public and should be observed in such a manner as shall merit and receive the endorsement of the community . . .'

"The duties of the Judicial Council are specified in the Constitution and By-Laws and among those duties the following is prescribed:

" 'The Council shall have jurisdiction on all questions of medical ethics and the interpretation of the laws of the Association.

" 'The Council at its discretion may investigate general professional conditions and all matters pertaining to the relations of physicians to one another and to the public, and may make such recommendations to the House of Delegates or the constituent associations as it deems necessary.

" 'The Council shall have authority to request the President to appoint investigating juries to which it may refer complaints or evidence of unethical conduct which in its judgment are of greater than local concern. Such investigating juries, if probable cause for action be shown, shall submit formal charges to the President, who shall appoint a prosecutor to prosecute such charges against the accused before the Judicial Council in the name and on behalf of the American Medical Association. The Council may acquit, admonish, suspend or expel the accused.'

"The primary obligation of both physicians and hospitals is to serve the best interest of the patients. The decision as to the ethical or unethical nature of practice must be based on the ultimate effect for good or ill on the public as a whole. All of the various questions involved in the relationship

between physicians and hospitals, both legal and ethical, particularly questions dependent on local conditions, must be considered in the first instance at the local level because of the various differences which of necessity exist in the many sections of the country.

"One of the factors that have aggravated physician-hospital relationship is the inclusion of medical services in the contracts of voluntary hospital service plans. The medical profession is fostering voluntary health insurance, and we believe that nothing should be done to disturb this very important and essential program. However, the American Medical Association has reaffirmed many times through its then Bureau of Medical Economics, its Judicial Council and the House of Delegates the principle that hospital service plans should exclude all medical services, and the contract provisions of such plans should be limited exclusively to hospital services. At the same time, so that there would be no misunderstanding as to which services should or should not be included, the House of Delegates has stated that '. . . if hospital service is limited to include only hospital room accommodations, such as bed, board, operating room, medicine, surgical dressings and general nursing care, the distinction between hospital service and medical service will be clear.' (Proceedings of the San Francisco Session of the House of Delegates, 1938, p. 31.) Past actions of the House of Delegates give every reason to reiterate that radiology, anesthesiology, pathology and physiatry constitute the practice of medicine.

"In order to initiate a method for remedying this situation, it is recommended that Blue Shield and Blue Cross be requested to cooperate to the extent of writing all new contracts in such a manner that Blue Shield will cover insurable medical services and Blue Cross will cover insurable hospital services. It is hoped that the professional and hospital authorities and the voluntary prepayment plans will cooperate in furthering these recommendations.

"Since the physician and hospital are interdependent, it is incumbent on both to be interested in all phases of their scientific and financial relationships. This means that the professional staff of the hospital has very definite responsibilities toward not only other members of the professional staff, whether active or courtesy, but also toward hospital management. The recommendations of the staff concerning medical matters are usually accepted by the management of the hospital through its board of managers or trustees. It must also be remembered that to be approved for residencies in specialties by the American Medical Association and the American College of Surgeons, certain requirements are mandatory to the institution, among them adequate pathologic and radiologic coverage. As a rule, the staff of a hospital elects an executive committee or works under an appointed executive committee to advise the lay officers of the institution purely on professional matters, and recommends who may or may not use the institution for professional work. Unfortunately, in many instances, the financial problems of the lay hospital management have been no affair of the staff or of its professional executive committee. This is wrong and probably the cause of most of the differences of opinion between physicians and hospital management. The financial problems of an institution in which a physician does his professional work are definitely of importance to him and to the professional staff. Proper consideration must be given to these problems if the hospital is to work efficiently and remain the workshop of the physician; without proper facilities the services rendered to the public are in jeopardy and these public services are the all-important function of both hospital and staff.

"Every professional man on the appointed staff should have a voice in the professional management of the institution. The pathologist, roentgenologist, anesthesiologist and physiatrist, as well as the other professional staff members, should have equal standing as active members of the staff with all the rights and privileges pertaining to other members of the staff of equal standing. The chiefs of these departments should be nominated and appointed in the same manner as are the chiefs of other major departments in the same hospital.

"The revised Principles of Medical Ethics has been written with all of these various factors in mind and is broad enough to cover all possible ethical physician-hospital relationships. The Constitution and By-Laws of the American Medical Association distinctly covers methods of procedure for all persons who have a complaint so that they may approach the Judicial Council. The functions of that Council are specifically delineated:

" 'In the event of a controversy between physician and physician, or physician and hospital management, on these problems, it is recommended that, since local conditions must be taken into consideration, these problems be resolved insofar as possible at the local level.

" 'There can be no exploitation of the doctor or of the hospital if everyone concerned in management and on the professional staff will work together to supply the greatest possible good quality medical and hospital services to the public. In any given controversy, every effort should first be made to settle the matter at the staff-management level. In case of failure to settle the controversy at this level, assistance of the county medical society should be requested. If, then, it cannot be resolved it should be submitted to a committee of the state medical association for advice and recommendation. If problems cannot be solved at the staff-management level, through the county medical society, or through the state medical association, the Constitution and By-Laws of the American Medical Association provides that '. . . the (Judicial) Council, at its discretion, may investigate general professional conditions and all matters pertaining to the relations of physicians to one another and to the public, and may make such recommendations to the House of Delegates or the constitutent associations as it deems necessary.'

"To implement the settlement of such controversies, it is recommended that each component medical society and each constituent state and territorial medical association appoint a Committee on Hospital and Professional Relations. This committee should be available to receive complaints from any physician, hospital, medical organization, or any other interested person or group with reference to professional or economic relations existing between doctors of medicine and hospitals. On receipt of such complaint by such a committee the matter should be investigated and acted on in such manner as will best effect adjustment of the complaint.

"Another approach that should not be neglected in activating this report is that of the local and state hospital associations. Most of the states and many communities have hospital associations providing direct representation for the hospitals within their areas. It seems reasonable to assume that state medical associations and component county medical societies could well effect liaison with these organizations in the settlement of problems involving physician relationships.

"In summary, the following general principles are suggested to individual physicians, county medical societies, and state medical associations as a basis for adjusting controversies, these principles, however, to be qualified to the extent required by the applicability of one or more of the factors heretofore mentioned:

"1. A physician should not dispose of his professional attainments or services to any hospital, corporation or lay body by whatever name called or however organized under terms or conditions which permit the sale of the services of that physician by such agency for a fee.

"2. Where a hospital is not selling the services of a physician, the financial arrangement if any between the hospital and the physician properly may be placed on any mutually satisfactory basis. This refers to the remuneration of a physician for teaching or research or charitable services or the like. Corporations or other lay bodies properly may provide such services and employ or otherwise engage doctors for those purposes.

"3. The practices of anesthesiology, pathology, physical medicine and radiology are an integral part of the practice of medicine in the same category as the practice of surgery, internal medicine or any other designated field of medicine."

MEDICAL NEWS

Members are invited to send to this office items of news of general interest, for example, those relating to society activities, new hospitals, education, etc. Programs should be received at least three weeks before the date of meeting.

Kenny Certificates Awarded

Fifteen registered nurses and physical therapists from seven states and two foreign countries were awarded certificates as graduate Kenny Therapists in the treatment of infantile paralysis. Dr. Miland E. Knapp, chief of physical medicine in charge of therapist training for the Foundation, presented the certificates.

They were among a group of 48 trainees, the largest class to be in training as student Kenny Therapists since Kenny Institute, the Kenny Foundation's International Kenny Therapist Training Center, was opened in 1942.

Designed to qualify trainees to become Kenny Therapists, a new 24-month course will be opened to registered nurses and physical therapists at Kenny Institute in June, 1952. Application blanks for Kenny Therapist training scholarships for nurses and physical therapists are available by writing to Director of Training, Sister Elizabeth Kenny Foundation, 1800 Chicago Avenue, Minneapolis 4, Minnesota.

Repeating Polio Courses in 1952

Aided by a grant from the National Foundation for Infantile Paralysis, the Orthopaedic Hospital of Los Angeles, California, announces short courses in Poliomyelitis-team approach to the total treatment of the patient, to be given February 11-15, May 19-23, and in October (dates to be announced).

Courses are designed to present all phases of patient care with emphasis on coordination of services. They are open to physicians, nurses, physical therapists and occupational therapists. For further information, contact Miss Miriam Thompson, OTR, Director of OT, Orthopaedic Hospital, 2400 South Flower Street, Los Angeles 7, California.

National Institute Awards

The National Institute of Neurological Diseases and Blindness of the Public Health Service, in addition to awarding research grants and fellowships, now has funds available for traineeships in the field of rehabilitation. These traineeships are to be awarded to those who are qualified and interested in the principles and practice of total rehabilitation of the disabling diseases. Traineeships will be extended to neurologists, psychiatrists, orthopedists, pediatricians, internists and other professional personnel. Training will be conducted in recognized rehabilitation centers throughout the country. All inquiries should be addressed to Dr. Pearce Bailey, Director of the National Institute of Neurological Diseases and Blindness, National Institutes of Health, Bethesda, Maryland.

Exhibit on Noise

At the Clinical Session of the American Medical Association held in Los Angeles, The Council on Physical Medicine and Rehabilitation presented an exhibit demonstrating the danger of noise as a health hazard.

(Continued on page 43)

Members
Standing Committees of the
American Congress of Physical Medicine
1952

Advances in Education

Earl C. Elkins, M.D., Chairman.
Thomas F. Hines, M.D.
Donald L. Rose, M.D.
William B. Snow, M.D.

Balneology and Health Resorts

Hans J. Behrend, M.D., Chairman.
William Bierman, M.D.
Kristian G. Hansson, M.D.
Walter S. McClellan, M.D.
Duane A. Schram, M.D.
Samuel A. Warshaw, M.D.

Constitution and By-Laws

Ralph E. DeForest, M.D., Chairman.
Miland E. Knapp, M.D.
Florence I. Mahoney, M.D.

Cooperation with Army, Navy, Public Health and Veterans Administration

Alvin B. C. Knudson, M. D., Chairman.
George G. Deaver, M.D.
John H. Kuitert, M.D.

Cooperation with Food and Drug Administration

Charles S. Wise, M.D., Chairman.
Nila Kirkpatrick Covalt, M.D.
Edward M. Krusen, Jr., M.D.
Bror S. Troedsson, M.D.

Finance

Walter M. Solomon, Chairman.
H. Worley Kendell, M.D.
Charles S. Wise, M.D.

Foster, Encourage and Co-ordinate Research Projects

Sedgwick Mead, M.D., Chairman.
Donald J. Erickson, M.D.
Fred B. Moor, M.D.

Program

Walter M. Solomon, M.D., Chairman.
Arthur L. Watkins, M.D.
Walter J. Zeiter, M.D.

Gold Key Awards

Gordon M. Martin, M.D., Chairman.
George G. Deaver, M.D.
Emmett M. Smith, M.D.
Arthur L. Watkins, M.D.
Jessie Wright, M.D.

Legislation

William Bierman, M.D., Chairman.
Odon F. von Werssowetz, M.D.
Charles S. Wise, M.D.

Medical Economics

Herman L. Rudolph, M.D., Chairman.
Louis P. Britt, M.D.
Joseph Koczur, M.D.

Meeting Place

Walter J. Zeiter, M.D., Chairman.
Kristian G. Hansson, M.D.
Paul A. Nelson, M.D.
Solomon Winokur, M.D.

Membership

Harold Dinken, M.D., Chairman.
Robert W. Boyle, M.D.
Harry H. Samberg, M.D.

Nominating

Earl C. Elkins, M.D., Chairman.
Miland K. Knapp, M.D.
Arthur L. Watkins, M.D.

Problems Affecting Physical and Occupational Therapists

William Bierman, M.D., Chairman.
Elizabeth Austin, M.D.
Donald A. Covalt, M.D.
Harriet E. Gillette, M.D.

Public Relations

Frank H. Krusen, M.D., Chairman.
Edward H. Lowman, M.D.
Oscar O. Selke, Jr., M.D.
Charles Stansky, M.D.

Awards for Scientific Exhibits

William H. Schmidt, M.D., Chairman.
Earl C. Elkins, M.D.
H. Worley Kendell, M.D.
Charles O. Molander, M.D.

(*Continued from page 41*)

Rehabilitation Association Formed

The Minnesota Rehabilitation Association was formed recently to promote the welfare of the handicapped through improvement of standards of professional workers who serve them by encouragement of adequate facilities for treatment, education and rehabilitation; education of the community to problems of the handicapped, and sponsorship of programs that advance their welfare.

Postgraduate Continuation Courses in Physical Medicine

Jewish Sanitarium and Hospital for Chronic Diseases — Clinical Rehabilitation — April, 10 weeks.

Kings County Hospital, Physical Medicine and Rehabilitation — April, 6 weeks.

New York Polyclinic Medical School and Hospital — Physical Medicine and Rehabilitation — Arranged, 4 weeks.

For additional information, write to Council on Medical Education and Hospitals, American Medical Association.

National Society Reports for 1951

Mr. Lawrence J. Linck, Executive Director of the National Society for Crippled Children and Adults, announced that services and facilities offered crippled children through the nation's Easter Seal societies reached an all-time high in 1951.

The total of professional persons trained for specialized work with the crippled under scholarships, fellowships, grants and workshops of the Easter Seal societies reached 700.

National Society Meets on West Coast

For the first time in its 30-year history, the National Society for Crippled Children and Adults, the Easter Seal Society, will hold its annual convention on the West Coast in 1952, it is announced by Lawrence J. Linck, executive director. The convention will be held in San Francisco, October 25 through 30, Mr. Linck said. The Fairmont Hotel has been selected as convention headquarters. Nationally recognized authorities in all professional fields related to work with the crippled will participate in the program. The annual meeting of the Delegate Assembly of the National Society and its 2,000 affiliates in the 48 states, District of Columbia, Alaska, Hawaii and Puerto Rico will be part of the convention activities.

Research Center on Poliomyelitis

The University of Michigan Hospital at Ann Arbor will open a research center for extensive clinical research on poliomyelitis. The center will be sponsored by the university and the National Foundation for Infantile Paralysis. Dr. James Wilson will have over-all supervision of the center.

Rehabilitation Conference

The Second Annual Rehabilitation Conference of the Bay State Society for the Crippled and Handicapped, Inc., will open March 12, 1952, at the Hotel Copley Plaza, Boston, Mass.

Accepted Device

Liebel-Flarsheim Short-Wave Diathermy, Model SW-660 Accepted. — Manufactured by The Liebel-Flarsheim Company, 303 W. Third St., Cincinnati, 2, Ohio, this apparatus generates radio frequency energy at 27.12 megacycles for medical application. A coaxial line oscillator is used for frequency control. The Council on Physical Medicine and Rehabilitation voted to include the device in its accepted list.

Personals

At the Physical Medicine and Rehabilitation Seminar held at the VA Hospital, Brooklyn, New York, on January 18, 1952, the following topics were presented: "Physical Treatment in Low Back Pain" by **Hans Kraus,** M.D.; "Ultrasonics and Its Application in Physical Medicine" by **H. J. Behrend,** M.D., and "Physical Medicine in the Treatment of Peripheral Vascular Diseases" by **Karl Harpuder,** M.D. Dr. **Otto Eisert** acted as Chairman.

The following officers were elected at the December, 1951, meeting of the Cleveland Society of Physical Medicine and Rehabilitation: Dr. **Harry T. Zankel,** President; Dr. **Roswell Lowry,** Vice-President; Dr. **Bert A. Treister,** Secretary-Treasurer. Doctors **Walter M. Solomon** and **Walter J. Zeiter** will serve on the Board of Trustees, along with the officers.

At the December meeting of the New York Society for Circulatory Diseases, Inc., Dr. **Walter S. McClellan** presented the topic, "Groedel as a Balneologist."

Lt. Col. **Raoul C. Psaki** was recently assigned to Letterman Army Hospital, San Francisco, California, as Chief of Physical Medicine Service. Dr. Psaki was former chief resident in physical medicine at Walter Reed Hospital, Washington, D. C.

Dr. **Arthur L. Watkins,** Massachusetts General Hospital, Boston 14, Mass., has been elected representative to the Scientific Exhibit, Section on Physical Medicine and Rehabilitation, American Medical Association, Chicago Session, June 9-13, 1952.

Dr. **Charles F. McKhann,** Cleveland, has recently been appointed as acting medical director of the United Cerebral Palsy Association. He states there are between 15,000 and 22,000 babies born each year in the United States with an incapacitating neurological handicap in the form of cerebral palsy alone, or in combination with a convulsive disorder or mental retardation.

Congress on Medical Education and Licensure

The 48th annual meeting will take place on February 10-12, 1952, at the Palmer House, Chicago. Write direct to the hotel for your reservation.

Newly Registered Therapists

December 7, 1951

Anderson, Malcolm Stone, 310 Campbell Ave., Tullahoma, Tenn.

Brautigam, Norman Lee, 603 Royal Dr., Jackson, Mich.

Chaix, Elmone Beatrice, 1656 Malcolm Ave., Los Angeles 24, Cal.

Clements, Jean May, Box 241, Riviera Beach, Fla.

Crabtree, William Roderick, 712 Vance Ave., Paris, Ill.

Crutcher, Mack, Jr., 212 Court St., Louisa, Ky.

Fox, Freda Isabel, R. D. No. 3, Smethport, Pa.

Gabala, John Michael, 48 Main St., Junedale, Pa.

Hill, Mary Alice, 319 N. Curtis Ave., Alhambra, Cal.

Holway, Clyde Robert, 4038 Vineland Ave., Baldwin Park, Cal.

Irwin, Thomas Benjamin, Rt. No. 1, Box 407½, Mira Loma, Cal.

Ishida, Grace Sachiko, 653 E. 165th St., Gardena, Cal.

Johnson, Margaret Mary, 8 Sycamore St., Albany, N. Y.

Kisling, Marilyn Mildred, 11 Deer Creek Woods, St. Louis, Mo.

Kreisle, Margaret Mary, 621 Division St., Evansville 11, Ind.

Mankin, Marion Ellen, 947 N. Orlando Ave., Los Angeles 46, Cal.

Moore, Harriet Mary, 1031 Commodore Dr., Richmond Heights, Mo.

Powderly, Clyde Albert, 107 Cheney St., Jerseyville, Ill.

Schamp, Barbara Ann, % Ralph Schamp, 2935 Lutaway St., Toledo, Ohio.

December 14, 1951

Bradley, Mary M., Vilas, N. C.

Cunningham, Grace Mabel, 77 Hackensack St., East Rutherford, N. J.

Dmytryshyn, Walter, 7440 Oakman Blvd., Dearborn, Mich.

Eatman, Jerome Rex, 3004 Ruffin St., Raleigh, N. C.

Everhard, Susan Felice, Rt. No. 1, New Philadelphia, Ohio.

Flanagan, Eleanor Mae, 828 Bronx River Rd., Bronxville 8, N. Y.

Gilchrist, Roy Allen, 403 W. Broad St., Darlington, S. C.

Holland, Emily Johnson, 107 Windsor Rd., Tenafly, N. J.

Messenger, Betty Jean, Rt. 1, Maidsville, West Va.

Miller, Lois Ann, 2363 Hanawha Blvd., E., Charleston, W. Va.

Pogue, Thomas Molloy, 1917½ S. 7th St., Ironton, Ohio

Sullivan, Mary Jean, 94 Seneca St., Hornell, N. Y.

December 18, 1951

Agresti, Mary Louise, 1581 Jackson St., Aliquippa, Pa.

Blauer, John H., 925 Kirkwood, Iowa City, Ia.

Bouman, Helen Louise, 1340 St. Charles Ave., Lakewood 7, Ohio.

Brunner, George David, 128 Kipling St., Elyria, Ohio.

Buschow, Elizabeth Ann, 904 Florida Ave., Pittsburgh 28, Pa.

Campbell, Shirley Isabelle, 160 Maple Ave., Blairsville, Pa.

Carpenter, Antoinette, 312 S. Fifth St., Geneva, Ill.

Chinn, Thelma, 55 Bridge St., Watsonville, Cal.

Cott, Barbara Emory, 6345 Glenview Pl., Pittsburgh 6, Pa.

Cottom, George Edward, 256 Connellsville St., Uniontown, Pa.

Cousens, George Edwin, 3035 Hamilton Ave., Richmond 3, Cal.

de Leon, Marisa Lusiardo, 3101 Gough St., Apt. 307, San Francisco 23, Cal.

Devlin, Mary Jane, 602 Sherman Ave., Pittsburgh 12, Pa.

Diznoff, Dorothy M., 1117 Chislett St., Pittsburgh 6, Pa.

Dodds, Rosemary Judith, 604 Fifth Ave., S., Moorhead, Minn.

Dorr, Mary Jeanne, 624 N. Linn, Iowa City, Ia.

Duccini, Ermine Raymond, Rt. 2, Box 101, Fair Oaks, Cal.

Dudek, Jean Rose, R. D. No. 1, Brown's Lane, Allison Park, Pa.

Eaton, John Richard, 411 W. 8th Ave., Gary, Indiana.

Fellows, Dale Russell, 614 S. Main, Sioux Falls, S. Dak.

Ferris, Anna Elizabeth, Grand View, Nyack, N. Y.

Fix, Nancy Lee, 1853 E. 93rd St., Cleveland, Ohio.

Galbraith, Margaret J., 296 Westlawn, Iowa City, Iowa.

Gorman, Geraldine M., 2145 Oregon, Berkeley, Cal.

Gossett, Robert L., 127 Fourth St., West, Brewster, Ohio.

Halstead, Daniel P., Jr., 1610 Second Ave., Walnut Creek, Cal.

Hauser, Elna Marion, 38 Clipper St., San Francisco 14, Cal.

Hayden, Ruth Scranton, 63 Imlay St., Hartford 5, Conn.

Hesch, Ann Elizabeth, Falling Rock, West Va.

Hirsch, Otto, 2252 Ashby Ave., Berkeley 5, Cal.

Hislop, Helen Jean, 2806 Parkway Ave., Linden, N. J.

Kasputis, Dorothy Elaine, 1802 8th St., Beaver Falls, Pa.

Kerr, Marian Frances, Box 222, Russell's Point, Ohio.

Kovach, Lorraine, 48 Hale St., San Francisco 24, Cal.

Levendosky, Florence Rosemary, 16 Twining St., Binghamton, N. Y.

Lewis, Selvin Thomas, 5614 Beacon St., Pittsburgh 17, Pa.

Liebermann, Mary Anna, R. D. Box No. 4, Latrobe, Pa.

Lindsey, Carolyn Ann, 1701 Barr Ave., Pittsburgh 5, Pa.

Lynch, Margery, 22 N. Grandview Ave., Pittsburgh 5, Pa.

Martens, Jean A., 9 Philmore Ave., Caledonia, N. Y.

Martz, Mary Gretchen, 15 Lance Dr., Charleston, W. Va.

Mason, Beverly Jane, R. R. No. 3, Galesburg, Ill.

Maul, Robert Glen, Box 217, Thomas, W. Va.

Meyer, LeRoy Donald, Box 455, Ackley, Iowa.

Miller, Deanie Nevada, 725 W. 18th St., Pueblo, Colo.

Miller, Jack Welsh, 312 Reed St., Clearfield, Pa.

Morse, Carolyn Frances, 955 Drewry St., N. E., Atlanta, Ga.

Mulroy, Joseph Earl, Box 552, Taft, Cal.

Murer, Niels Peter, 559 Ortega St., San Francisco 22, Cal.

Newton, Virginia Wachter, R. D. No. 1, Evans City, Pa.

Nochta, Robert, 3722 E. Indian School Rd., Phoenix, Ariz.

Oishi, Marion Tamiko, 3024 Blossom St., Oakland 1, Cal.

O'Meara, John Vincent, Hawarden, Iowa.

Pagan, Orfa Nereida, G. Z. A., 30, Puerto Nueno, P. R.

Pancake, Sally Ann, Romney, West Va.

Paustian, Wayne Vernette, Box 435, Gladbrook, Iowa.

Porterfield, Clifford Edward, R. D. No. 1, Butler, Pa.

Raines, Paul A., 142 73rd St., North Bergen, N. J.

Reid, Doris Hayes, 729 N. Martha, Dearborn, Mich.

Reiger, Fatina Fay, 4618 Forbes St., Pittsburgh 13, Pa.

Robertson, Hazel Elizabeth, 1209½ E. Ridgewood St., Orlando, Fla.

Schippers, Ronald LeRoy, 915 Finkbine Park, Iowa City, Iowa.

Simon, William Wassel, Box 211, Vestaburg, Pa.

Smith, Garland Morris, 243 Jarrott Lane, El Cajon, Cal.

Smith, Henrietta, 217 10th St., Huntington, W. Va.

Smith, Shirley Eleanor, 133 Elmore Rd., Pittsburgh 21, Pa.

Steding, Dallan Louis, 228 Reifert St., Pittsburgh 10, Pa.

Steele, Helen Joan, 3325 Meade St., Denver, Colo.

Stevens, Joyce Whistler, 1048 Orchard Rd., Lafayette, Cal.

Strohm, Bernard Robert, 116 Central Park, Iowa City, Iowa.

Takacs, Stephen Joseph, Sabraton, W. Va.

Weaver, Ralph Edward, Jr., 1424 Forsythe St., Pittsburgh 12, Pa.

Wilson, Edith Elizabeth, 1424 Church Ave., Scranton 8, Pa.

Wojciak, Raymond Joseph, 322 Lehigh St., Pittsburgh 32, Pa

30th Annual Session

SCIENTIFIC EXHIBIT SPACE

Requests for applications for scientific exhibit space in connection with the 30th Annual Session to be held at The Roosevelt, New York, New York, August 25, 26, 27, 28, 29, 1952, are being received. Address all communications to the American Congress of Physical Medicine, 30 North Michigan Avenue, Chicago 2.

BOOK REVIEWS

CLIMATE IN EVERYDAY LIFE. By *C. E. P. Brooks*, I.S.O., D.Sc., F. R. Met. Soc. Cloth. Price, $8.75. Pp. 314 with 34 illustrations. Philosophical Library, Inc., 14 East 40th Street, New York 16, 1951.

Initially interested in the deterioration of various materials stored in the tropics, the author has gradually broadened the scope of his work to include the effects of temperate and frigid climates on materials of all sorts, including especially the substance of the human body. This leads directly to those aspects of physical medicine or biophysics dealing with human reactions to temperature, humidity, atmospheric pressure, air movement, and so on. The book is divided into three parts: (1) Living with the Climate, (2) Climate as an Enemy, and (3) The Control of Climate. The last-named section includes a discussion of air conditioning, lighting, and clothing. Especially direct and undeniable are the phenomena discussed in the chapter on "Climatic Accidents," where the author describes the loss of life attending floods, hail, lightning, and windstorms. The discussion of clothing is brief but up to date. The book is well illustrated and indexed, and lacks only specific information on the geography of human disease to make it useful to the practicing physician.

FACTORS REGULATING BLOOD PRESSURE, Transactions of the Fourth Conference, Sponsored by the Josiah Macy Foundation, February 23-24, 1950, New York, N. Y. Edited by *Benjamin W. Zweifach* and *Ephraim Shorr*. Department of Medicine, Cornell University Medical College, New York, N. Y. Fabrikoid. Price, $3.00. Pp. 212 with 39 illustrations and 26 tables. Josiah Macy, Jr., Foundation, 565 Park Avenue, New York 21, 1951.

This volume is a complete record of the transactions of the fourth conference of the Josiah Macy, Jr., Foundation on factors regulating blood pressure. As a nucleus, fifteen scientists were selected by the Chairman, Doctor Harry Goldblatt, and an annual two day meeting is held at periods of five years. This is the fourth meeting of the group. Every effort is made to include representatives from all pertinent disciplines. As a result plans and ideas are often modified, conclusions more clearly specified or placed on a broader perspective, and spontaneous collaboration take place between investigators working in different departments or even in different universities.

Experience in the research field has led to the conviction that one of the greatest needs today is reintegration of science which is now artificially fragmented by the isolation of the several scientific disciplines. It is the aim of the conference to give a clearer reflection of what takes place in the laboratory and what goes on in the minds of investigators.

Members of this conference are all men who are outstanding scientists who have enriched our knowledge of this perplexing problem. Chairman of the Conference was Doctor Harry Goldblatt. Other members are Doctors Ephraim Shorr, Stanley Bradley, Lewis Dexter, William Dock, William Goldring, Keith Grimson, Arthur Grollman, O. M. Helmer, Eugene Landis, Eric Ogden, and Irvine H. Page. Subjects discussed were: anatomical considerations of hypertension; histological changes in liver and kidney of rats made hypertensive by a choline deficient diet; clinical criteria for the diagnosis and classification of hypertension; renal circulatory adjustments in relation to hypertensive disease; relations of endocrine organs to essential hypertension; necrotizing arteritis in dogs produced by a combination of high fat diet and experimental renal insufficiency; comparative study of experimental renal and human essential hypertension with respect to the participation of the hepatorenal vasoactive factors, V. E. M. and V. D. M.; treatment and prophylaxis of experimental renal hypertension with renin; purification of angiotonin by chromatography and partial separation of renin and sustained pressor principle from kidney and estimation of the renin content of the kidney in normal animals and in different experimental conditions. Each paper is concluded with a verbatim discussion and a list of valuable references. For those physicians who are interested in the subject of hypertension this book will prove invaluable. However, it should be in the hands of all physicians who wish to keep advised of the changing medical horizon.

PHYSICAL BIOCHEMISTRY. By *Henry Bull*, Ph.D., Professor of Chemistry, School of Medicine, Northwestern University. Second Edition. Fabrikoid. Price, $5.75. Pp. 355 with illustrations. John Wiley & Sons, Inc., 440 Fourth Avenue, New York 16, 1951.

The author states the purpose of this volume is to bring to the student of the biological sciences a picture of physical chemistry which is meaningful to him. Doctor Bull has used the experimental rather than the theoretical approach. It is most important that medical students acquire a broad training in the basic sciences so they can develop a background which will enable them to integrate to some extent the enormous and diverse material with which they are faced. Without such a background the physician will find it difficult to keep pace with the changing therapeu-

tic disciplines which are continually occurring in the field of medicine during his lifetime.

This second edition of the book has been completely revised — about one-third has been completely rewritten and new material woven into the pattern of the text. The volume is an outgrowth of a series of lectures given to graduate students in biochemistry, physiology, bacteriology, and neurology. The contents include the following chapters: atoms and molecules; energetics; reaction kinetics; ions in solution; electrical conductance; electromotive force cells; acids and bases; oxidation and reduction; electrokinetics; surface activity; biopolymers; osmotic pressure and related properties; viscosity and the flow of liquids; diffusion; the ultracentrifuge; and high polymeric structures. Each chapter is closed with a series of problems and questions and an excellent list of references are given as footnotes.

The excellent text is well presented and the material well organized. While it does not bear any direct relationship to physical medicine it will interest the physiatrist engaged or interested in research.

FACIAL PARALYSIS, Being a Treatise on a Clinical Classification of Paralysis of the Facial Nerve. By *J. Parkes Findlay*, M.B., Ch.M., Honorary Assistant Oral Surgeon, Sydney Hospital. Published by the Author and Distributed by Angus & Robertson, Ltd., 89 Castlereagh St., Sydney, Australia, 1950. Cloth. Price, 17s, 6d.

This small monograph of 47 pages is devoted in large part to a description of the anatomy of the facial nerve including blood supply and muscle innervation derived from standard texts. Symptomatology and an adequate description of electrical tests are presented and then the main thesis, that of division of Bell's palsy into three groups: geniculate, neuritic, and vascular occlusion palsies. The first is largely a quotation from Hunt's classical description. The second is primarily infectious in relation to nearby structures. The third group is thought to be due to sudden occlusion of the vaso-nervorum and is characterized by sudden onset of paralysis and acute postauricular pain. The prognosis of the first two groups is said to be good in 80 per cent with little or no treatment, although massage, splinting and electrical stimulation are mentioned. The treatment of the third group is said to be surgical, namely, decompression. No statistics are supplied as to experiences in the various groups. Electrical tests are said to be of doubtful value and immediate operation indicated if pain is present leading to a diagnosis of occlusion of the blood supply. An unconvincing account of the need or value of surgery and of the diagnostic categories is included.

MEDICAL DIAGNOSIS: APPLIED PHYSICAL DIAGNOSIS. Edited by *Roscoe L. Pullen*, M.D., F.A.C.P., Professor of Graduate Medicine, Director of the Division of Graduate Medicine, and Vice Dean of the School of Medicine, Tulane University of Louisiana; Senior Visiting Physician, Charity Hospital of Louisiana at New Orleans; Consultant in Medicine, Veterans Administration Hospital, New Orleans, Louisiana; Consultant to the Surgeon General, Department of the Army, Washington, D. C. Second Edition. Cloth. Price, $12.50. Pp. 1119, with 601 figures, 46 in colors. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5, 1950.

Even books on physical diagnosis must be revised in a relatively short time today. With the increasing scope of medicine, the mere description of the physical findings is not sufficient. Thus a book such as this, which integrates the history, the physical examination and the use of various accessory procedures such as x-ray, electrocardiograms and other laboratory findings, is more instructive. The emphasis in this book still remains on the examination of the patient, but by including these other factors, the establishment of a diagnosis is more rational.

The book is divided into chapters in which each section of the body is covered by different authorities. Additional chapters discuss the medical history, examination of the patient, electrocardiographic diagnosis, endocrine survey, the child, the aged, and others.

This new edition brings the material up to date. New chapters include one on blood diseases, diagnosis in the aged, and physical examination of the psychiatric patient.

YOUR BLOOD PRESSURE AND YOU. By *George Halperin*, M.D. Paper. Price, $1.00. Pp. 94. Brownlee & Shaw, 1227 Loyola Avenue, Chicago, Ill., 1951.

Another one of these little booklets that tell the poor layman about his troubles. It follows the usual plan of explaining everything so simply, with just enough technical words and explanations thrown in to give the reader a sense of learning the intricacies of medicine. Most of the ideas that cause the greatest anxieties are oversimplified, of necessity; however, to shake the reader's complacency, the customary technique is used in the style, which can be summed up thus — there is nothing to worry about, but. Whether a booklet of less than a hundred pages that can be read in about thirty minutes is worth one dollar might be questioned; but then, what does a dollar buy in this year of 1952.

PHYSICAL MEDICINE ABSTRACTS

Occupational Therapy for Cerebral Palsy. E. M. James.

Brit. J. Phys. Med. **14**:149 (July) 1951.

Occupational therapy for cerebral palsy, in recent years, has become a very specialized field of work. Ideally, a child with cerebral palsy should be treated from babyhood by a team of therapists comprising a physical therapist, occupational therapist and, in many cases, also a speech therapist. The entire program of treatment for a cerebral palsied child must be carried out by the whole team of therapists. For example, the physical therapist will teach the athetoid basic relaxation while lying, sitting, and later control of standing and walking. The occupational therapist will be the link between physical therapy and every day life; she must carry the arm relaxation a stage farther and use it for arm occupations. The speech therapist will use relaxation to achieve control of speech. For the spastic and ataxic, similar teamwork is necessary as determined by the different principles of treatment. Each individual cerebral palsy child needs to be handled as his handicap demands and this must be done consistently by all who deal with him, including the parents, to whom his particular problem must be explained. Their cooperation by and with the therapists is essential in the over-all aim of treatment if the child is to become capable of taking his place in the world.

Shoulder-Hand Syndrome Following Myocardial Infarction: Treatment by Procaine Block of the Stellate Ganglion. Daniel M. Swan, and John M. McGowan.

J. A. M. A. **146**:774 (June 30) 1951.

The shoulder-hand syndrome occurs in approximately 10 to 20 per cent of cases of myocardial infarction. The degree of disability reported has been variable: in some cases it has been described as minor; in other cases it has been extremely severe, leading to serious incapacity and inability of the patient to perform useful work. Formerly, treatment recommended for this condition included physical therapy, roentgen treatments, ganglionectomy and periaterial sympathectomy. A sufficient number of cases of procaine block of the stellate ganglion have been reported in the literature to indicate the beneficial results of this treatment. This paper reports the results of treatment of a series of patients with shoulder-hand syndrome by stellate block with procaine hydrochloride by the anterior approach. This method is considered to be fairly simple and is consistently successful when employed with a reasonable amount of skill. The results have been excellent in every case.

Technique of Ultrasonic Therapy. Albert W. Bauer.

Brit. J. Phys. Med. **14**:145 (July) 1951.

It is now well known that ultrasonic energy evokes a variety of biological responses of interest to therapy. Some of the medical applications of ultrasonics reflect the enthusiasm for new methods of treatment rather than clinical discretion or biological understanding. Others are well founded in clinical experience. It should be noted that in the course of the last twelve years a certain technique was developed in the application of ultrasonic energy which, on the whole, has been taken into account in the design of ultrasonic equipment. Nevertheless, many problems are still unsettled. When choosing ultrasonic treatment one must select: (a) the frequency, (b) the type of waves, (c) the intensity, (d) the type of soundhead, (e) the method of application, (f) the duration, and (g) the number of sessions. The main indications for the use of ultrasonic energy are the so-called rheumatic diseases. The ultrasonic energy tends to soothe and restore movement.

Acceleration of Convalescent Care of Poliomyelitis Patients. Charles L. Lowman.

J. A. M. A. **146**:1097 (July 21) 1951.

Lowman recommends (1) an over-all plan for the patient through all stages of treatment with evaluation of the physical therapy aspects of care; (2) a thorough evaluation of performance, especially in relation to trunk muscle imbalance and potential deformity factors; (3) early surgical reconstruction when necessary and advisable; (4) an all-around increased effort to conserve patients' and workers' time and personal and institutional funds by increase in the tempo of care of poliomyelitis patients to the highest point commensurate with careful consideration of the needs of each patient.

Tarsal Anomalies and Peroneal Spastic Flatfoot. Frederick S. Webster, and William M. Roberts.

J. A. M. A. **146**:1099 (July 21) 1951.

In the treatment of spastic flatfoot the early recognition of tarsal anomaly as the etiological factor in its production is important. The plan of therapy varies somewhat depending upon the anomaly, the type of syndrome, the age of the patient, and the degree of secondary arthritic involvement. Conservative measures are primarily reserved for cases which have only an occasional complaint following trauma and for cases of symptomatic talocalcaneal anomalies in children too young for arthrodesis of the foot. The for-

mer cases consist of those with a calcaneonavicular bar exhibiting the second type of syndrome. In these absolute rest of the foot, aided perhaps by whirlpool baths, will cause the acute symptoms of spasm and fixation to subside, but treatment is required over a moderately long period of time and normal flexibility of the foot is never obtained. Consistent support is maintained through the use of firm rubber arch pads. Plaster immobilization under anesthesia is of value since it allows maximal relaxation of the peronei and maintains support of the foot, though usually the same result may be accomplished through rest and whirlpool baths. Manipulation in itself is of no value and actually may be harmful. The rigidity resulting from the anomalies themselves after release of the peroneal spasm does not further improve under anesthesia, and forcing correction is either futile or causes additional injury to the region of congenital abnormality which was the exciting factor originally.

Muscle Relaxants in Low-Back Disorders. Edit.

J. A. M. A. **146**:930 (July 7) 1951.

Schlesinger and Stinchfield reported recently on the use of the muscle relaxant mephenesin as a diagnostic and prognostic aid in acute disorders of the lower back. The drug was administered intravenously to 64 hospitalized patients with acute symptoms and signs of herniated intervertebral disk and its effect on the pain and on the results of the straight-leg-raising test was observed. They noted four types of reaction: (1) Abrupt relief of low-back and sciatic pain and striking increase in the range of leg motion; (2) abrupt relief of pain with only slight or moderate increase in range of leg motion; (3) abrupt relief of pain with no increase in motion, and (4) rapid relief of local pain, paradoxical aggravation of radiating pain and decrease or no change in straight-leg-raising ability. The muscle relaxation produced by mephenesin has also been found helpful as an adjunct to traction and in the relief of pain in various low-back syndromes, by the above-mentioned authors and by others, but it appears likely that the drug will have its greatest usefulness in differential diagnosis and prognosis.

Arthrodesis of the Ankle Joint:. A Simple, Efficient Method. Newton C. Mead.

Quart. Bull., Northwestern Univ. M. School **25**:248 (Fall) 1951.

Surgical fusion of the ankle joint becomes necessary when injury, paralysis, joint disease, or congenital malformation result in loss of function which cannot be restored through more conservative means. It is indicated for many cases of degenerative arthritis which follow traumatic derangement of this weight-bearing joint. Occasionally comminuted fractures produce such severe disorganization of the joint that arthrodesis may wisely be obtained as promptly as possible without waiting for the inevitable painful function which will follow attempts to achieve a normal joint. Other indications are chronic infections, especially tuberculosis, and instability resulting from the congenital lack of an adequate ankle mortice. The flail ankle sometimes produced by infantile paralysis may require fusion of the ankle joint, as well as subtalar arthrodesis, to produce a stable foot. The method described in this paper achieves stability and rapid healing without the use of free grafts, and is more simple technically than any method previously used. It results in a narrow, attractive looking ankle. Since no free graft is used, the postoperative course is not prolonged by the need for revascularization. So far, no disadvantages have been discovered. Experience with this operation has been limited to ankles with traumatic arthritis and to one case in which subtalar arthrodesis had been previously performed. It would seem to be indicated in all situations in which an intra-articular arthrodesis of the ankle is desired, except severe congenital deformities, in which one of the malleoli may be absent. In these situations a bone graft and metal fixation may be necessary. In cases where primary arthrodesis is elected for severe fractures of the ankle, the technique used will vary with the type of fracture, but it often will turn out to be similar to the operation described in this paper. Mead used the technique successfully in such cases for years before he realized that it was a good method for elective arthrodesis of this joint.

Device for Measurement of Differences in Height of Opposite Sides of Body. H. Wright Seiger.

J. A. M. A. **143**:1232 (July 28) 1951.

A device for measurement of differences in height of opposite sides of the body is described in detail. It is simple, accurate and may be made at a cost of a few dollars. Measurement with this device requires only a few seconds. It will give accurately, to one-eighth inch, a record of the comparative length, when the patient is standing erect, or both sides of the body at various levels and more particularly of the lower extremities.

Poliomyelitis: Early Diagnosis and Treatment. Martin H. Seifert.

Quart. Bull., Northwestern Univ. M. School **25**:286 (Fall) 1951.

The problem of diagnosis is still a perplexing one, because of the relative rarity of the disease. The most important quality of the physician in the diagnosis of any disease is suspiciousness. In regard to poliomyelitis, when illness occurs, with fever, particularly between July 1 and November 1, you should think of poliomyelitis. If you consider it at all, you will at least do the things that would rule it out. Once the diagnosis of poliomyelitis has been settled, the patient should be taken to the hospital, placed in a poliomyelitis bed with a board under the mattress, a foot board separated from the mattress by blocks, with blanket, sheets and no pillow. Passive motion of the arms and legs should be started four or five times

daily from the beginning in any but the most critically ill patient, as this will frequently save weeks of stretching later. As the fever recedes, Kenny packs are ordered, as needed, for sore or tight muscles. When the febrile period is passed and the patient is strong enough to tolerate it, have the physical therapist do a detailed muscle analysis. When this has been completed (it may take several days to do it piece-meal in a severely involved patient), the orthopedist should check the patient and prescribe packs, exercise, hydrotherapy in tub or tank, and whatever else might be necessary for treatment of the disability. The caution to be added here is cooperation between the medical attendant and the orthopedist to make sure that the treatment is not too strenuous for the individual patient. It serves no useful purpose to wear out the patient in the process of rehabilitation. In the treatment of the bulbar case, as in no other patient, teamwork is essential. If the patient is handling his secretions well and breathing adequately, leave him alone, except for careful watching and helpful nursing. Remember, restlessness, uncooperativeness, and combativeness on the part of the patient are not signs of a peculiar personality. They are signs of anoxia. Many times such a patient has become entirely rational and cooperative within a few minutes after the airway was cleared by suction or tracheotomy. There is no disease in which teamwork is so important as in poliomyelitis. The attending physician, the nursing staff, the resident staff, the laryngologist, orthopedist, physical therapist, occupational therapist, and, on occasion, the anesthetist, must all cooperate if success is to be attained.

A Traction Device for Fractures of the Forearm. Walter A. Wichern, and Robert H. Bacon.

J. A. M. A. **146**:1233 (July 29) 1951.

A traction device for the reduction of fractures of the forearm is described in detail. The device is capable of applying efficient fixed traction, of known amount, which is adequate for the reduction of almost all Colles type fractures without further manipulation. The design and technique of its use and the results are given.

Vascular Complications in Fractures and Traumatology. Donald S. Miller, and Leo Markin.

Indust. Med. and Surg. **20**:323 (July) 1951.

The treatment of these complications is of utmost importance. "Gentleness" should be the keynote in the treatment of any vascular complications in traumatology. It is most important to be "vascular conscious" in order to avoid disastrous end results. A cardiorenal vascular survey, including fundoscopic examinations, is important in the elderly group in order to determine the general arteriosclerotic status. A vascular survey, as indicated above, is extremely important and necessary. Avoidance of trauma to collateral and main blood vessels during surgery, elimination or removal of all tourniquets, casts, bandages, and dressings, avoidance of sudden extension in correction of arthritic or fixed deformities, and avoidance of extensive surgery in the aged are some of the important preventive measures. Heat and cold, applied promiscuously to an avascular extremity, should be avoided. Preliminary sympathectomy or paravertebral block injections, as indicated, should be done. Foot hygiene, bed exercises, small doses of alcohol by mouth, as well as some of the commercial vasodilators and anticoagulants should also be used in the proper cases.

Potassium Deficiency in Bulbar Poliomyelitis. Hyman S. Lans; Irving F. Stein, Jr.; Robert J. Becker; Archibald L. Hoyne, and Karl A. Meyer.

J. A. M. A. **146**:1017 (July 14) 1951.

Three patients with bulbar poliomyelitis were found to have a potassium deficiency. Treatment of the existing deficiency with intravenously administered potassium chloride resulted in a marked improvement of their condition. Patients suffering from bulbar poliomyelitis who are unable to eat will develop a potassium deficiency unless adequate potassium intake is provided. Severe, prolonged potassium deficiency can be lethal. This condition when present in patients with bulbar poliomyelitis may be a contributing factor in the high mortality rate. Proper treatment of electrolyte imbalance in these patients is essential and must include adequate potassium therapy. Further studies are indicated concerning the relationship of potassium deficiency to the clinical picture and mortality of poliomyelitis.

Second Attacks of Poliomyelitis: Report of a Case with Autopsy Findings. Archibald L. Hoyne, and Irving Lipton.

J. A. M. A. **146**:707 (June 23) 1951.

A second attack of poliomyelitis with fatal termination and autopsy findings is presented. It is probable that this is the only reported authenic second attack with fatal outcome. Moreover, it is the first case recorded with complete pathological examination. On gross and microscopic examination the nervous system exemplified evidence of both recent and past pathology. It has been suggested that second attacks of poliomyelitis are due to an immunologically different strain against which the patient has no previous immunity.

Dyshidrosis Produced by General and Regional Ultraviolet Radiation in Man. M. L. Thomson.

J. A. M. A. **146**:684 (June 16) 1951.

In a hot, wet environment general ultraviolet radiation in moderate erythemal doses produced, in seven persons acclimatized to heat but not to radiation, up to 60 per cent diminution in sweating rate on the second or third day after exposure. After recovery from the disturbance of sweating caused by one exposure to radiation, a second exposure produced a further fall in sweating rate

in the same persons. The wavelengths causing the reduction in sweating rate are probably present in natural sunlight.

Cause of Changes in Sweating Rate After Ultraviolet Radiation. M. L. Thomson.

J. A. M. A. 146:684 (June 16) 1951.

The vesicular rash found in many subjects after ultraviolet radiation provided evidence that blockage of sweat gland ducts was at least partly responsible for the diminished sweating that followed the radiation. Occlusion of a proportion of the sweat gland ducts in irradiated skin was confirmed histologically. Blockage of sweat gland ducts, however, appears not to be the sole factor responsible for the decreased sweating. Indirect evidence suggests that the secretion itself is reduced. It is suggested that the reduced secretion is brought about by toxins that have diffused from the injured epidermis. Skin injury produced by allyl isothiocyanate (mustard oil) also caused a fall in sweating rate similar in extent and duration to that produced by ultraviolet radiation. The slight reduction of sweating rate caused by locally applied massive doses of histamine suggested that the above effect of ultraviolet radiation and allyl isothiocyanate was not mediated through the release of a histamine-like substance.

Parkinsonism and Rheumatoid Arthritis. Ralph O. Wallerstein.

Ann. Int. Med. 34:899 (Apr.) 1951.

Eighty years ago Charcot first called attention to the possible relationship between Parkinsonism and rheumatoid arthritis. Since then several investigators have pointed out similarities between the two diseases. In an effort to evaluate critically the relationship between the two diseases, 19 patients with frank clinical paralysis agitans, and 28 patients with far advanced, chronic atrophic arthritis were examined. In most patients with Parkinsonism the onset of illness had been very gradual; weakness and tremor had been the first symptoms. In conducting the examinations, attention was focused primarily on the joints. In the majority of the patients, the appearance of the hands bore a marked resemblance to the hands found in chronic rheumatoid arthritis. There was ulnar deviation of the wrists and fingers, flexion at the metacarpophalangeal joints, extension at the phalangeal joints and adduction of the fingers and thumb; in other words, all muscles innervated by the ulnar nerve seemed overactive. Poverty of motion of trunk and face, with attitude of flexion at elbows and knees, enhanced this resemblance. But whereas in atrophic arthritis there is a true loss of mobility, affecting passive as well as active motion and usually ankylosis and deformity, full range of motion could be obtained in the joints of patients with Parkinsonism after overcoming the muscular rigidity by passively flexing and stretching all the large and small joints of the extremities. The patients suffering from rheumatoid arthritis had a definite story of onset with fever and joint pain. In all patients the disease had progressed to complete crippling, with joint destruction and ankylosis. Only one patient appeared to have both diseases. In view of the number of cases of Parkinsonism (19) and rheumatoid arthritis (28) among a group of 500 patients, this coincidence cannot be considered significant. There appears to be no increased incidence of rheumatoid arthritis among patients suffering from Parkinsonism.

Reconstructive Surgery of the Hand. William L. White.

Pa. M. J. 54:330 (Apr.) 1951.

Today traumatic injuries of the hands constitute a major portion of all injuries. Industrial estimates of hand injuries usually exceed 20 per cent of all reported traumatic lesions. The management of these hand injuries requires a knowledge of plastic surgery, orthopedic surgery, neurosurgery, physical therapy, occupational therapy, and brace making; for reconstructive surgery of the hands must include treatment of the entire part, including all systems that may be involved. In the management of joint difficulties of the hands, the first thoughts often will be directed to physical and occupational therapy and the use of activated splints, utilizing springs or rubber bands. Physical therapy hastens the resolution of the processes of repair, occupational therapy develops useful motion, while active splints gently pull the stiffened useless joints into functional position and supply the movable parts with a gentle force to work against. The rehabilitative features of surgery of the hand are not limited to any particular period, but should be continued throughout the entire management. Greatest emphasis, however, is placed upon the use of occupational therapy and work therapy, after completion of all surgical procedures. The place of physical therapy is limited beyond the point of aiding the recovery from the healing reaction.

Treatment of Acne. Leon Goldman.

Postgrad. Med. 9:526 (June) 1951.

Local cleansing and drying measures are continued now in a more regular fashion. The older individual has the responsibility of carrying out these directions by himself or herself. Regular daily ultraviolet therapy may be had at home. This should be supervised by the parent until the youth gets old enough to do it himself. Ultraviolet therapy should be in doses of suberythema and should be discontinued in the presence of irritation. Efforts should be made to prevent the child from going to sleep under the ultraviolet lamp. In the seborrheic patient, therapy with ultraviolet has a good effect. X-ray therapy is reserved for the older youth, for the nodulocystic phases; this form of treatment should be given only by the experienced specialist, and then only as part of a planned regimen, not as the sole therapeutic measure.

The Orthopedic Management of Arthritis. Paul C. Colonna.

Pa. M. J. 54:443 (May) 1951.

In the early stage of arthritis, many of the joint deformities can be obviated by careful attention to the sleeping position of the patient, by the use of fracture boards under the mattress, and by stressing better body balance in walking. Simply the weight of the bed clothes is a factor in producing an equinus or drooping of the foot in those patients recumbent much of the time. Allowing the patient to relax in bed in a semi-Fowler position may give rise to hip and knee contractures as well as deformities of the spine. If simple conservative measures are neglected in the early phase, very resistant deformities may be developed later. Measures directed toward better body posture and improvement of local circulation in the impaired joint by the various modalities of physical medicine, stressing the loss of excess body weight and the restriction to weight-bearing when the arthritis involves the lower extremities, are all-important. Non-weight-bearing exercises such as swimming and exercises under the control of the physical therapist can usually be recommended. Splints and braces all have their place in the conservative management. Fatigue, exposure to damp atmospheric conditions, mental worry, and emotional strain of one sort or another can definitely aggravate the picture, and in the rehabilitation of these patients, many factors on a psychosomatic basis must be considered. Rehabilitation always is a slow process and the aim in these patients rarely can be to cure the patient, for in most of them certain irreparable damage has been done to the affected joint or joints. However, the patient can be made more comfortable and able to return to a gainful occupation.

Visual and Motor Changes in Patients with Multiple Sclerosis: A Result of Induced Changes in Environmental Temperature. Thomas C. Guthrie.

Arch. Neurol. & Psychiat. 65:437 (Apr.) 1951.

Climate and temperature have been recognized as affecting the incidence of multiple sclerosis. Although sex and race appear not to be important factors in its occurrence, its geographical distribution seems to vary significantly with the distance of an area from the equator. According to one study of the mortality statistics in 14 countries, there is "an inverse and rather striking relationship between reported mortality due to multiple sclerosis and mean annual temperature. The colder the climate, the higher the crude death rates for multiple sclerosis." A definite statistical relationship of multiple sclerosis to seasonal variations in temperature does not seem to exist. In the past, in an attempt by physicians to discover effective therapeutic approaches to multiple sclerosis, patients have been subjected to various forms of heating. On the rationale that the disease may be caused by a virus and that a heat-sensitive organism may be found in the spinal fluid, 12 patients were subjected to immersion in a hot bath at 110 F. for 10 minutes. After 115 baths given to the 12 patients, the condition of four showed improvement; that of six showed no change, and that of two became worse. In a general discussion of therapy with hot baths, to patients with multiple sclerosis, the observation was made that "muscle weakness ordinarily was not favorably influenced." Several attempts have been made to treat multiple sclerosis with electropyrexia. With local diathermy, given over the spinal cord, to 13 patients, 10 showed improvement; one relapsed and was then cured; one became worse, and one had questionable results, but the criteria for improvement are vague, and no control series is reported. In general reference to electropyrexia, the comment has been made that fever may bring out latent neurological abnormalities. In general, while hot baths, diathermy, fever cabinets and pyrexia induced with foreign protein have been tried several times in the treatment of multiple sclerosis, inconclusive results have gradually led to their disrepute as effective agents. Of the changes that seem to appear during heating, the generalized weakness, arm weakness, leg weakness and dysarthria have, in general but not always, been present in the patients with multiple sclerosis before heating. The effect of the hot baths seem mainly to have been one of rendering these dysfunctions more evident.

Radioactive Isotopes and Malignancy. Richard H. Chamberlain.

Pa. M. J. 54:550 (June) 1951.

The emissions of radioactive isotopes have proved to be useful in the diagnosis of certain tumors, notably tumors of thyroid gland origin and brain tumors. At the present time the practical clinical application of radioactive isotopes in the treatment of neoplastic disease is largely limited to selected cases of thyroid carcinoma, polycythemia vera, and certain leukemias by means of radioactive iodine and phosphorus. New applications of radioactive gold and cobalt are being explored. Further advances in the biochemistry of cancer may greatly enhance the therapeutic as well as the diagnostic possibilities in the use of these agents.

An Assessment of Therapy in Parkinson's Disease. Robert S. Schwab, and John S. Prichard.

Arch. Neurol. & Psychiat. 65:489 (Apr.) 1951.

Since 1817, when James Parkinson recognized the entity of paralysis agitans among the heterogeneous collection of tremors and paralyses, the most persistent attempts have been made to treat this disease. Charcot thought some of his patients were benefited by riding on horseback. Consequently, he had constructed a fauteuil trepidant, on which he made his patients sit and shake for stated periods. A pupil of his, Gloreux, was

so impressed with this idea that he prescribed for his patients a two hour ride each day on as bumpy a conveyance as was possible. During the past five years patients with paralysis agitans were given four types of treatment, as well as combinations of them: physical therapy, psychotherapy, surgical treatment, and drug therapy. The physical therapy consisted of either the routine therapy with massage and passive motion, or intensive progressive resistance exercises of the involved muscles under the direction of Dr. T. L. DeLorme. As concerns the effect of physical therapy of the routine type, namely, referral of the patient to the physical therapy department two or three times a week for massage and passive motion, or having a masseur come to the patient's home two or three times a week for the same treatment, Schwab and Prichard formed the following impression: During the actual massage and passive exercises the patient almost always felt better. He was more relaxed and comfortable. As soon as the patient left the physical therapy department, his symptoms returned, and the benefit of the treatment lasted only an hour or two at the very most. There was no evidence in this type of physical therapy of any true benefit, change in symptoms, improvement in signs or alteration in the progress or state of the disease. The special approach through progressive resistance exercises is a separate project, in which a specific weakness or stiffness in one muscle group, for example, in the left leg, or even both legs, rather than a generalized involvement, is the chief disability. These patients are seen in consultation with Dr. T. L. DeLorme and are taken into this project only if they are willing to come in for two to three hours' treatment, four times a week, for two to three months. The other forms of therapy, usually medication, which the patients have been receiving are kept exactly the same throughout this period of observation. Careful assessment is made each week as to changes in signs and in the patient's ability to perform his usual tasks at home and at work. At the end of the project the treatment is stopped for a period of at least a month to see whether any improvement attained has regressed. In a preliminary group of five patients receiving this type of treatment, three have greatly improved in their strength and muscle function and in the ability to use these muscles in normal activities, such as walking and climbing stairs. There has also been a favorable improvement in mood. However, there is no alteration in the objective signs, such as tremor or rigidity or loss of associated movements. One patient in this group continued for six weeks and then reverted suddenly to the previous level after he had been badly shaken up in an automobile accident. This stress was sufficient to make the period of treatment following the accident (one month) ineffective. The fifth patient showed no improvement in any form, and the treatment was discontinued at the end of a month.

Rheumatoid Spondylitis. S. K. Conner.

Arizona Med. 8:33 (June) 1951.

Rheumatoid spondylitis is a chronic, progressive disease characterized by variable remissions and exacerbations. With each exacerbation there is increased deformity and limitation of motion. Its course may become arrested at any stage of progression, and pain becomes less as ankylosis occurs, whether the patient's spine is straight or kyphosed. There is no known cure for rheumatoid spondylitis, but early, continuous treatment of the right nature will do a great deal to give relief of pain, prevent spinal deformity, and at times shorten the course of the disease. Symptoms often are relieved after complete ankylosis has occurred except for the limitation of motion and certain activities. Orthopedic prevention of deformities is much more effective than is their correction. Much can be done by the orthopedist to relieve strain, spasm, and to prevent loss of height, kyphosis of the spine, and ankylosis of the hips. Proper beds, sleeping habits and proper braces afford much relief. Physical therapy in the form of local heat and gentle massage increases the sense of well being, aids muscle spasm and tone, and prevents somewhat muscular atrophy and contractures. Deep breathing and postural exercises done regularly and untiringly are of the utmost importance. Successful as well as encouraging results in treatment depend on early diagnosis as much as the correct type of therapy.

The Painful Back. A. W. Bagnall.

Canad. M. A. J. 64:107 (Feb.) 1951.

In most patients with painful backs, psychotherapy must be more practical than intellectual. They get better by feeling better. Non-narcotic anodynes and mild sedation provide the medicinal background but the really important measures are physical therapy and life adjustment. X-ray therapy occasionally is effective after the fashion of a long-lasting anodyne — not for any curative effect on the cause. Physical therapy is directed to exercises designed to build up the spinal musculature to protect against the ordinary jars of everyday life and to maintain a useful range of motion. Erector spinae muscle weakness is a common cause of back pain and, in itself, produces a feeling of physical inferiority contributing its full share to the symptom complex. With the cooperation of the patient, simple non-weight-bearing exercises taught by a skilled physical therapist can do wonders to bolster flagging morale and adapt the afflicted person to resume a gainful occupation. Reasons have been given why the clinical and therapeutic approach to the patient with a painful back must be "total" to be successful. An attempt has been made in this discussion to outline some of the mechanisms by which back pain is produced as a result of the strains of living in this highspeed world of today. Two of these pain-producing mechanisms, overactivity of the sympathetic nervous system, and

imbalanced function of the pituitary-adrenocortical axis are discussed in more detail.

The Precipitation of Clinical Poliomyelitis by Injections. I. S. Goerke.

Calif. Med. 74:383 (May) 1951.

In records of 1,321 cases of poliomyelitis in the city of Los Angeles in 1948, notation was made as to whether or not the patient had been vaccinated against smallpox or had received an injection of one kind or another in the period preceding the onset of poliomyelitis. In children under 12 years of age, the incidence of poliomyelitis was slightly higher among those who had had recent vaccination or injection than among those who had not, and the incidence of paralysis was slightly greater also. However, the disparities were not considered statistically significant. They were not wide enough to warrant withholding immunization against other serious diseases on the strength of the possibility that in so doing a slight reduction in the incidence of crippling poliomyelitis might be effected.

Safety Factors in the Clinical Use of Radioisotopes. Clinton C. Powell.

M. Ann. District of Columbia 20:471 (Sept.) 1951.

The potential radiation hazards connected with the use of radioisotopes in humans should be carefully evaluated in terms of the quantity, half-life, and type of radiation involved. On the basis of the evaluation, precautions should be taken to minimize the hazard from the patient as a source of external radiation by the use of distance, time, and shielding. Adequate personnel dosimetry is essential. Consideration should be given to the patient as a source of radioactive contamination with particular emphasis on the disposal of the excreta. These considerations should also extend to such related problems as surgical procedures, postmortem examinations, the transportation of cadavers, and the fogging of x-ray films.

Diagnosis and Treatment of Chronic Occlusive Disease of the Peripheral Arteries. Nelson W. Barker.

Journal-Lancet 71:58 (Feb.) 1951.

The diagnosis of chronic occlusive disease of the peripheral arteries is not difficult if the physician has a high threshold of suspicion for its presence when patients have pain, ulceration, gangrene, changes in temperature or discoloration in an extremity. The most important physical sign is impairment of pulsations in the peripheral arteries. Postural color changes are a good rough indication of the degree of ischemia. There are two important chronic occlusive peripheral arterial diseases, thromboangiitis obliterans and arteriosclerosis obliterans, and almost always they can be distinguished clinically. The general principles of treatment can be classified under the broad headings of: efforts to arrest the progress of the disease; procedures to produce dilatation of uninvolved arteries and arterioles; efforts to increase circulation by mechanical means; procedures for direct relief of pain; instruction in prophylaxis against injury of ischemic tissues, and treatment of ulceration and gangrene.

Three types of apparatus have been used to increase the circulation by mechanical means, namely, the pavaex alternating suction and pressure machine, the intermittent venous compression apparatus and the oscillating bed. At best these are only adjuncts to other methods of treatment. The first has been almost abandoned. The second is of doubtful rationale and is being used less and less. The oscillating bed seems to be helpful in some cases of severe ischemia and is still being used in most hospitals where it is available.

Chicago Society of Physical Medicine and Rehabilitation

The regular February, 1952, monthly meeting of the Chicago Society of Physical Medicine and Rehabilitation will be held on Wednesday, February 27, 1952, at the City of Chicago Welfare Convalescent Home, 51st St. and Vincennes Ave., Chicago, 8:00 P. M. Dinner will be served before the meeting at 6:30 P. M. Dr. Arthur A. Rodriquez will present the topic "Rehabilitation Program." Reservations should be made early with the Secretary of the Society, Dr. Milton G. Schmitt, 6970 N. Clark St., Chicago 26.

PHYSICAL MEDICINE AND REHABILITATION **

The following services are approved by the Council and the American Board of Physical Medicine and Rehabilitation. Residencies in this specialty have been approved without specifying the number of years for which they are accredited. The Board will give appropriate credit for training in these hospitals on an individual basis.

Hospitals, 43 Assistant Residencies and Residencies, 87

Name of Hospital	Location	Chief of Service	Inpatients Treated	Number of Treatments	First Year Residencies Offered*	Total Residencies Offered*	Beginning Stipend (Month)
UNITED STATES ARMY							
Letterman Army Hospital★	San Francisco	A. E. White	3,330	74,961	...	...	.....
Fitzsimons Army Hospital★	Denver	H. B. Luscombe	19,403	258,913	1	4	.....
Army Medical Center★	Washington, D. C.	J. H. Kuttert	6,755	263,456	3	5	.....
VETERANS ADMINISTRATION							
Veterans Admin. Hospital★†	Long Beach, Calif.	R. N. Nyquist	10,922	195,816	1	2	.....
†Veterans Admin. Hospital †	Fort Logan, Colo.	F. J. Fricke	907	36,326	...	...	.....
Veterans Admin. Hospital	Hines, Ill.	L. B. Newman	5,665	450,711	...	...	.....
Veterans Admin. Hospital †	Wadsworth, Kans.	L. Blau	3,189	192,760	...	...	.....
Veterans Admin. Hospital †	Framingham, Mass.	F. Friedland	7,000	210,000	1	3	.....
Veterans Admin. Hospital †	Jefferson Bks., Mo.	E. H. Weissenb'g	2,218	77,491	1	1	.....
Veterans Admin. Hospital †	New York City	A. S. Abramson	13,819	314,026	3	9	.....
Veterans Admin. Hospital †	Cleveland	H. T. Zankel	6,414	81,929	1	1	.....
†Veterans Admin. Hospital	Portland, Ore.	E. W. Fowlks	4,954	110,420	1	1	.....
†Veterans Admin. Hospital †	Aspinwall, Pa.	S. Machover	2,516	106,131	...	1	.....
Veterans Admin. Hospital★†	Houston, Tex.	B. L. Boynton	1,582	6,894	1	1	.....
NONFEDERAL							
Los Angeles County Hospital★†	Los Angeles	E. Austin	.....	91,836	...	1	165
White Memorial Hospital★	Los Angeles	F. B. Moor	195	.....	1	1	120
University of Colorado Medical Center-Colorado General Hospital★†	Denver	H. L. Dinken	2,580	45,876	1	3	75
State of Connecticut Vet. Home & Hosp.	Rocky Hill, Conn.	.....	.....	.....	3	3	.....
Emory University Hospital★	Emory Univ., Ga.	R. L. Bennett	1,719	10,473	1	1	50
Georgia Warm Springs Foundation	Warm Springs, Ga.	R. L. Bennett	973	104,401	1	3	250
Cook County Hospital★†	Chicago	D. Kobak	7,501	37,516	...	...	.....
Michael Reese Hospital★†	Chicago	C. O. Molander	2,254	19,589	1	1	25
Northwestern University Medical Center	Chicago	.....	13,580	40,962	...	...	.....
Research and Educational Hospitals★†	Chicago	H. W. Kendell	5,688	11,769	1	3	55
University of Kansas Medical Center★†	Kansas City, Kans.	D. L. Rose	2,456	42,310	1	1	100
Massachusetts General Hospital★	Boston	A. L. Watkins	2,925	31,999	0	9	41.66
University Hospitals★	Ann Arbor, Mich.	.....	.....	.....	...	...	.....
University of Minnesota Hospitals★†	Minneapolis	M. Knapp	20,409	29,136	4	4	.....
Mayo Foundation	Rochester, Minn.	F. H. Krusen	.....	.....	2	6	135
Barnes Hospital★	St. Louis	S. Mead	9,759	9,759	0	1	.....
†Bellevue Hosp., Div. III, N. Y. Univ.★†	New York City	H. A. Rusk	4,058	116,705	...	7	80
Goldwater Memorial Hospital★	New York City	M. Dacso	733	50,706	1	2	80
Hospital for Joint Diseases★†	New York City	J. Weiss	.....	94,631	1	1	40
Hospital for Special Surgery	New York City	K. G. Hansson	20,806	40,810	1	1	160
Mount Sinai Hospital★†	New York City	W. Bierman	11,942	36,970	1	1	50
New York City Hospital★†	New York City	F. K. Safford, Jr.	1,138	41,088	1	1	130
†Presbyterian Hospital★†	New York City	W. B. Snow	35,865	103,546	1	1	208
St. Luke's Hospital★† §	New York City	R. Muller	900	98,954	1	1	60
†Rehabilitation Hospital	W. Haverstraw, N. Y.	M. Hoberman	5,868	408,371	1	1	225
Cleveland Clinic Hospital †	Cleveland	W. J. Zeiter	17,065	38,475	1	4	.....
Hospital of the University of Pa.★†	Philadelphia	G. M. Piersol	1,636	35,639	0	1	.....
Philadelphia General Hospital★†	Philadelphia	A. A. Martucci	2,827	23,733	1	1	75
Medical College of Virginia—Hosp. Div.★†	Richmond, Va.	W. J. Lee	4,575	40,327	...	...	46.50

The star (★) indicates hospital approved for intern training.
The dagger (†) indicates temporary approval.
† Residencies open to women.
** Reprinted in part J. A. M. A. 147:140 (September 29) 1951.

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HISTORICAL NOTE

During recent years the view has been widely expressed that an International Congress of Physical Medicine should be held, and at the International Congress on Medical Electronics held in Brussels in 1948, it was suggested that London might be a suitable place for such an event. To this end the British Association of Physical Medicine was informally approached. The Council of this Association felt strongly that such an endeavor should be a regularly recurring event organized by a permanent international body, and undertook to foster the formation of such an international body.

As a preliminary step, the Interim Committee of the International Federation of Physical Medicine was set up in May, 1950, under the Chairmanship of Dr. Frank Krusen, Rochester, Minnesota, U. S. A., with Dr. Svend Clemmesen, Copenhagen, Denmark, as Vice-Chairman. This Interim Committee issued reports on its activities and drafted regulations which were circulated to national Associations of Physical Medicine, with the object of securing international support and the nomination of national representatives. As a result of this Committee's further efforts, membership of the Council for the Co-Ordination of International Congresses of Medical Sciences was secured. Having decided that the first Congress under its auspices would be held in London, the Committee invited the British Association of Physical Medicine, as the national association concerned, to appoint a small committee with powers to form an independent Board of Management responsible for the organization of an International Congress of Physical Medicine in 1952. At the Congress, which will be held in London, a meeting of the national representatives will be called and asked to form the International Committee of Physical Medicine.

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Name and Location of School	Medical Director and Technical Director	Entrance Requirements[1]	Duration of Course	Classes Begin	Maximum Enrolment	Tuition	Certificate, Diploma, Degree
Medical Department — U. S. Army							
(Address all inquiries to the Office of the Surgeon General, Department of the Army, Washington 25, D. C.)							
Medical Field Service School, Brooke Army Medical Center, San Antonio, Texas	Charles D. Shields, Lt. Col., M.C.	e	49 wks.	Mar. Sept.	26	None	Certificate
Fitzsimons Army Hospital, Denver	Agnes P. Snyder, Major, WMSC H. B. Luscombe, Col., M.C.	Affiliated with Medical Field Service School					
Letterman Army Hospital, San Francisco, California	Olena M. Cole, Maj., WMSC Raoul C. Psaki, Lt. Col., M.C.	Affiliated with the Medical Field Service School					
Walter Reed Army Hospital, Washington, D. C.	Emma Harr, Maj., WMSC I. H. Kuitert, Lt. Col., M.C. Brunetta Kuehlthau, Maj., WMSC	Affiliated with Medical Field Service School					
Nonfederal							
Childrens Hospital, Los Angeles*	S. S. Matthews, M.D.	a-b-d	14 mos.	Sept	14	$300	Cert. or Degree
College of Medical Evangelists, Los Angeles*	Mrs. Mary J. Dodge	a-b-c	15 mos.	Sept	16	$300	Cert. or Degree
University of Southern California, Los Angeles*	F. B. Moor, M.D. R. Wm. Berdan	a-b-d	14 mos.	Sept	16	Univer.	Certificate
University of California School of Medicine, San Francisco*	C. L. Lowman, M.D. Charlotte W. Anderson	f	4 yrs.	FebSept	6	Univer.	Cert. & Degree
Stanford University, Stanford University, Calif.*	Lucile Eising, M.D. Margery L. Wagner	d	12 mos.	Sept	16	$220[2]	Cert. or Degree
University of Colorado Medical Center, Denver*	W. R. Northway, M.D.	a-d-e	12 mos.	Varies	29	$690	Certificate
Northwestern University Medical School, Chicago	Lucille Daniels	f	4 yrs.	Sept	16	$220 qr.	Degree
State University of Iowa College of Medicine, Iowa City*	Harold Dinken, M.D. Mary Lawrence	a-b-d	12 mos.	Sept	12	$208[3]	Cert. or Degree
University of Kansas Medical Center, Kansas City, Kan.*	E. D. W. Hauser, M.D. Gertrude Beard	a-b-d	12 mos.	Oct	16	$450	Certificate
Simmons College, Boston	W. D. Paul, M.D. Olive C. Farr	e	12 mos.	Sept	20	$200	Certificate
Boston University College of Physical Education for Women, Sargent College, Cambridge, Mass.	D. L. Rose, M.D. Ruth G. Monteith	d	12 mos.	FebSept	2	$40[2]	Certificate
Bouve-Boston School in affiliation with Tufts College, Medford, Mass.	W. T. Green, M.D. Shirley M. Cogland	f	4 yrs.	FebSept	9	$40[2]	Degree
University of Minnesota, Minneapolis*	Kenneth Christophe, M.D. Adelaide L. McGarrett	a-e	16 mos.	Sept	24	College	Diploma
Mayo Clinic, Rochester, Minn.*	Howard Moore, M.D. Constance K. Greene	f	4½ yrs.	Sept			Degree
St. Louis University, Division of Health and Hospital Services, St. Louis*	F. J. Kottke, M.D. Ruby Green Overmann	c-d-e-f	1-2-4 yrs.	Sept	30	Univer.	Cert. or Degree
Washington University School of Medicine, St. Louis*	E. C. Elkins, M.D. Harry Keown	f	4 yrs.	Sept	16	$650	Dipl. & Degree
Albany Hospital, Albany, N. Y.	A. J. Kotkis, M.D. Sister Mary Imelda	c	2 yrs.	Sept	20	$126	Degree
Columbia University College of Physicians and Surgeons, New York City*	Sedgwick Mead, M.D. Beatrice F. Schulz	a-b-c	2 yrs.	Sept	38	$250	Certificate
New York University School of Education, New York City*	J. W. Ghormley, M.D. Catharine Graham	f	4 yrs.	JanSept	12	$175 Semes.	Degree
Duke University, Durham, N. C.*	W. B. Snow, M.D. Floy L. Pinkerton	c	2 yrs.	Sept	16	$450 1st yr. $325 2d yr.	Degree
Cleveland Clinic Hospital, Cleveland*	G. G. Deaver, M.D. Elizabeth C. Addoms	a-b-d	12 mos.	Sept	6	$300	Certificate
D. T. Watson School of Physical Therapy, Leetsdale, Pa.*	L. D. Baker, M.D. Helen Kaiser	f	4 yrs.	Sept		$500	Degree
Divison of Physical Therapy of the School of Auxiliary Medical Services of the University of Pennsylvania, Philadelphia*	Walter J. Zeiter, M.D. Mildred Heap	a-c-e	1-2 yrs.	Sept	50	$680 (1 yr.) $1,200 (2 yrs.)	Cert. or Degree
University of Texas School of Medicine, Galveston*	Jessie Wright, M.D. Kathryn Kelley	a (+1 yr. coll.) b-d	12 mos.	Sept	40	$615	Cert. & Degree
Hermann Hospital, Houston, Texas*	G. M. Piersol, M.D. Dorothy E. Baethke	a-b-d	15 mos.	Oct	12	$350	Certificate
Baruch Center of Physical Medicine and Rehabilitation, Medical College of Virginia, Richmond*	G. W. N. Eggers, M.D. Ruby Decker	a-b-c	12 mos.	Oct	12	$200	Diploma
University of Wisconsin Medical School, Madison*	O. O. Selke, Jr., M.D. Mary Elizabeth Kolb	a-b-d	12 mos.	Oct	25	$300	Diploma
	W. J. Lee, M.D. Susanne Hirt	e	12 mos.	FebSept	32	$600	Certificate
	H. D. Bouman, M.D. Margaret A. Kohli	f	4 yrs.	Sept	40	$600	Cert. & Degree
		a-b-d	12 mos.	Jan	8	$149[2]	Cert. or Degree
		a-b-d	12 mos.	Oct	15	$300	Certificate
		a-b-d	12 mos.	Sept	52	$300[7]	Diploma
		f	4 yrs.	Sept			Degree
		a-b-d	12 mos.	Sept	22	$60	Certificate
		f	4 yrs.	FebSept	20	Semes.[2]	Cert. & Degree

** Reprinted in part J. A. M. A. 146:197 (May 12) 1951.

1. Courses are so arranged that any of the entrance requirements will qualify students for training. a = Graduation from accredited school of nursing; b = Graduation from accredited school of physical education; c = Two years of college with science courses; d = Three years of college with science courses; e = Four years of college with science courses; f = High school graduation.

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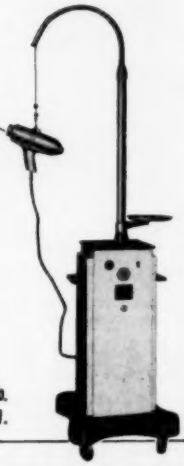

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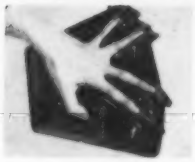

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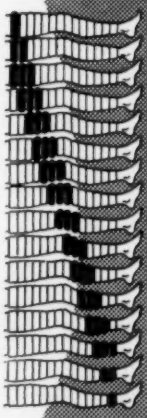

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American Congress of Physical Medicine. — 30th Annual Session, The Roosevelt, New York, New York, August 25, 26, 27, 28, 29, 1952. Walter J. Zeiter, M.D., Chairman, Convention Committee, 30 North Michigan Ave., Chicago 2.

Section on Physical Medicine and Rehabilitation of the American Medical Association. — Tuesday, Wednesday and Thursday morning of the A. M. A. meeting (June 10, 11 and 12, 1952) in Chicago. Secretary, Walter J. Zeiter, M.D., Cleveland Clinic Foundation, 2020 East 93rd St., Cleveland 6, Ohio.

Chicago Society of Physical Medicine and Rehabilitation. — Meetings, fourth Wedesnday, January through May, 1952. Milton G. Schmitt, M.D., Secretary, 6970 N. Clark Street, Chicago 26.

Latin-Amerian Congress of Physical Medicine. — Fourth Congress of Physicians in the Latin countries and the United States interested in Physical Medicine, Panama City, R. P., February 24-29, 1952. Executive Director, Cassius Lopez de Victoria, M.D., 176 East 71st Street, New York 21, N. Y.

The National Society for Crippled Children and Adults, Inc. — 1952 annual convention, Fairmont Hotel, San Francisco, October 26, 27, 28 and 29, 1952. Lawrence J. Linck, Executive Director, 11 South La Salle Street, Chicago 3.

American Occupational Therapy Association. — Annual Convention, August 9-16, 1952, Milwaukee, Wisconsin, Hotel Schroeder. Marjorie Fish, OTR, Executive Director, 33 West 42nd Street, New York 18, N. Y.

American Physical Therapy Association. — Philadelphia, Pennsylvania, Bellevue-Stratford Hotel, June 23,-28, 1952. Mildred Elson, Executive Director, 1790 Broadway, New York 19, N. Y.

International

International Congress of Physical Medicine (1952). London, July 14 to 19, 1952. Applications for the provisional program should be addressed to the Honorary Secretary, Dr. A. C. Boyle, International Congress of Physical Medicine (1952) 45, Lincoln's Inn Fields, London, W.C. 2.

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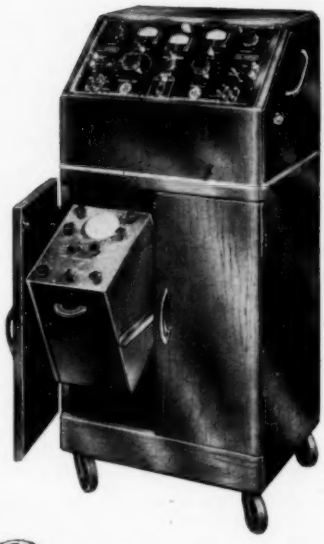

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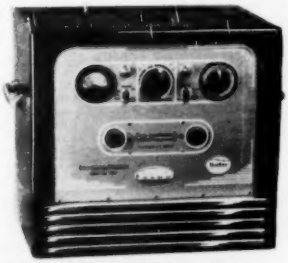

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Georgia Warm Springs Foundation GRADUATE COURSE

Physical Therapy and Occupational Therapy in the Care of Poliomyelitis

This course is open to graduates of approved schools in physical therapy and occupational therapy. Such graduates must be members of the American Physical Therapy Association and/or the American Registry of Physical Therapists and Occupational Therapy Association.

Tuition: None. For Scholarship to Cover Transportation and Maintenance, Contact National Foundation for Infantile Paralysis, 120 Broadway, New York 5, New York.

Entrance Dates: First Monday in January, April, July and October.

Duration of Course: The Course is divided into two parts:

Part I. Over-all care of convalescent polio with particular emphasis and special training in muscle testing and muscle reeducation.

Part II. Particular emphasis and special training in functional testing and functional retraining.

Each Part lasts three months and only selected students who have completed Part I will be admitted to Part II. All students applying for Part I must be willing to remain through Part II if selected.

For Information Write:

ROBERT L. BENNETT, M.D.
Georgia Warm Springs Foundation
WARM SPRINGS, GEORGIA

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THE AMERICAN REGISTRY OF PHYSICAL THERAPISTS

The PIN
(About Actual Size)

The official pin is made of 1/10 carat gold with purple enamel trim.

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(Including Federal Tax)

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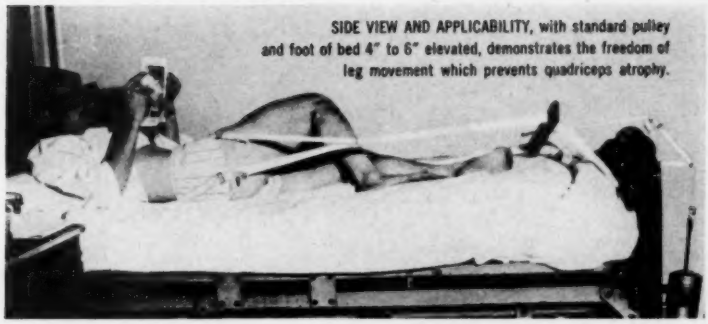

SIDE VIEW AND APPLICABILITY, with standard pulley and foot of bed 4" to 6" elevated, demonstrates the freedom of leg movement which prevents quadriceps atrophy.

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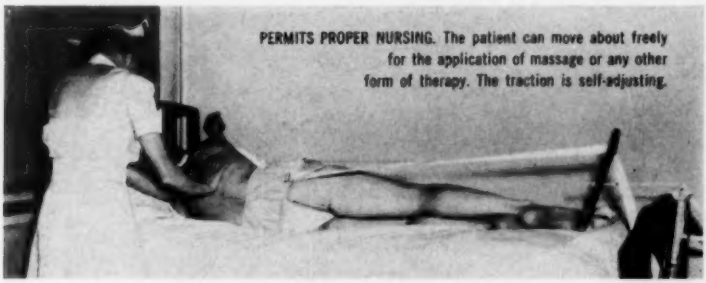
An effective and practical adjunct in the treatment of low back injuries, following the tested designs of Dr. Samuel Varco.

Clinicians regard it as a marked improvement over present traction methods. In no way does it restrict the use of any other modalities which may be desired.

Ease of application, cheerful acceptance by the patient, its availability for men, women and children at hospital or home and a decrease in the demands on the nursing staff make the Camp-Varco Pelvic Traction Belt a distinct contribution. Write for literature.



PERMITS PROPER NURSING. The patient can move about freely for the application of massage or any other form of therapy. The traction is self-adjusting.

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January 4, 1952

To The Medical Profession:

As I enter a New Year I pause to give thanks to Him who has guided my destiny over the years and permitted me to have so many noble friends among the medical profession.

Yours sincerely,

Cecil Birtcher

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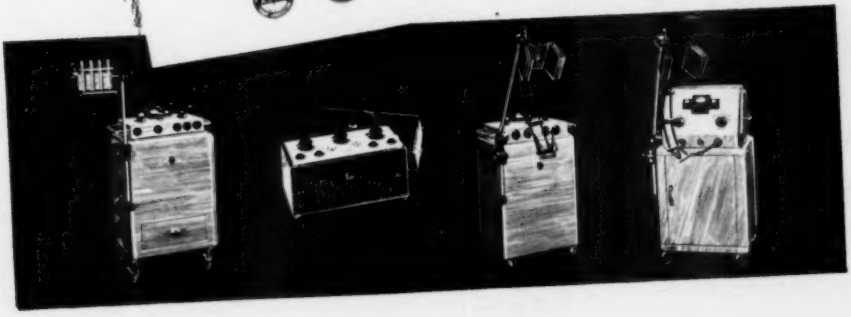
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